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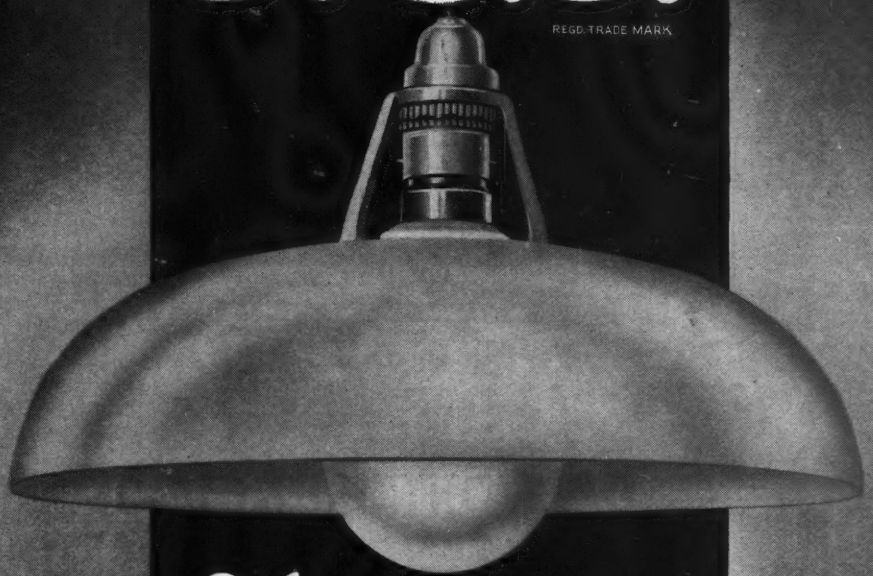

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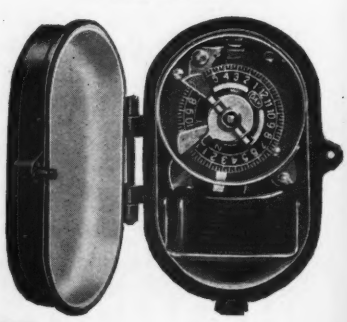

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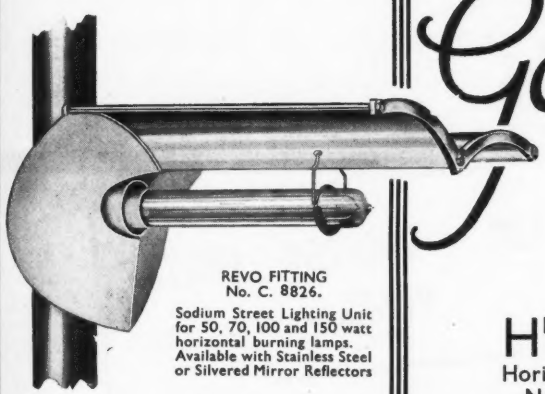

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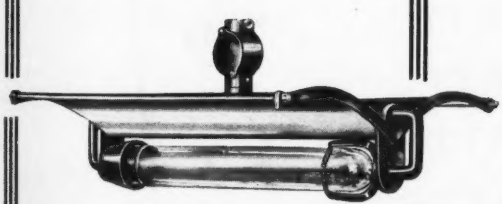

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Light and Lighting

Official Journal of the Illuminating Engineering Society.

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Edited by J. STEWART DOW

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We need Quality of Light —as well as Quantity!

LIGHT is much more abundant to-day. Consumers are urged to use as much as they need, not to be parsimonious.

How much do they need? The "Recommended Values of Illumination" recently issued by the Illuminating Engineering Society are designed to answer this query.

But the provision of a certain standard of illumination in foot-candles is not everything. We need to tell users how the light should be directed, how to avoid glare, what sort of shadows they need.

An instructive case is the lighting of printing works. In America special types of fittings have been introduced, furnishing indirect light, and so arranged as to minimise troublesome reflection of light from polished type.

Again, we know very little yet about the value of coloured light for certain kinds of work.

We may find that every job requires its own fitting—or at least its own special arrangement of lighting units to give the right quality as well as quantity of light.

Lighting Problems—The Needs of the Eye—Industrial Lighting Conference at Coventry—Testing Flashing Lights—News from Holland—Sodium Lamp Developments—Lighting Printer's Type.

Questions and Answers

The informal meeting of the Illuminating Engineering Society, on March 31, devoted to "Questions and Answers," the second meeting of this kind that the Society has held, was quite an entertaining one. Mr. F. C. Smith was to have presided, but was prevented from doing so by pressing official business. Mr. J. G. Clark, who kindly acted as his substitute at rather short notice, had quite a variety of problems to present. These were debated keenly until the termination of the meeting about nine o'clock, half an hour beyond the time originally allotted. Although it is understood that no official reports of informal meetings are presented, there can be no harm in alluding briefly to one or two of the most interesting topics discussed. Some of these were photometric—there was the insoluble problem of comparisons of sources of light of widely different colours, and the meaning (if any) to be assigned to "a white lumen" and "a red lumen." Mr. Cunnington revived an old argument (in which, it turned out, he and the chairman were originally concerned!) on the basis of estimating intrinsic brilliancy of sources of light.

"Blockage" of Light

Mr. F. K. Sawyer discussed the comparative candle-power of mantles arranged in lines and clusters. Contrary to what might be expected, the cluster is, in general, the more efficient, any loss of light due to blockage of one mantle by another being more than offset by the higher efficiency resulting from their proximity and the increased temperature. Discussion on this point branched off into an analysis of what happens in the case of tubes containing luminescent vapours placed one behind the other; in this respect neon, mercury, and sodium all behave differently. Luminous tubes again figured in a question answered by Mr. Lingard, who showed how to estimate the length of architectural lighting tubing necessary to produce a given illumination.

The Demands of the Eye

Another bunch of questions concerned the response of the eye to light. Discussion raged round the question whether ability to perceive small contrast may actually be impaired by the use of relatively high illuminations; this appears at least doubtful. Other contributions, such as that by Mr. Howard Long, illustrated the importance of direction of light, apart from mere brightness, in revealing the nature of surfaces in certain industries. One inquiry, which led to a particularly interesting discussion, related to the common demand for exceptionally high illuminations by people who are "getting on in life." It was suggested that this demand (which may take the form of an apparent liking for glare!) is really due to imperfections of the eye which can be partially eliminated if the pupil aperture is diminished by strong light, thus giving better definition in the same way as a small stop on a camera lens. Incidentally, it was remarked that this experience shows that the use of a picture of an eye with an enlarged pupil, to illustrate a condition of good lighting free from glare, is a somewhat unfortunate one. The eye undoubtedly works best with a relatively small pupil aperture.

Forthcoming Events.

May 12th—The **Annual Meeting** of the Illuminating Engineering Society. After the Presentation of the Annual Report and Accounts, and the Transactions of Formal Business, an **Address** will be delivered by Dr. MERRY COHU (Paris) dealing with Reflection from Road Surfaces and Developments in Lighting in France *(at the Institution of Mechanical Engineers, Storey's Gate, Westminster, S.W.1)*; **7 for 7.30 p.m.**

Industrial Lighting Conference at Coventry

An enterprising step was the recent Conference on Industrial Lighting arranged by the E.L.M.A. Lighting Service Bureau in Coventry. This was opened on March 18 by a luncheon, at which delegates were received by the Mayor of Coventry, Alderman C. Payne. Mr. W. J. Jones dealt with "Light and Sight," and Mr. J. W. Howell with industrial lighting. The part played by inadequate lighting as a cause of accidents was emphasised. It was pointed out that quite 70 per cent of accidents in factories are caused by quite common things, such as falls down stairs or over projecting bars, articles left in gangways or other objects unperceived. Many of these might have been avoided with better lighting. Mr. W. Turner, the Inspector of Factories in Coventry, quoting from an experience extending over twenty-three years, during which he had inspected some 10,000 works, remarked upon "the glorious hit-and-miss methods" adopted in lighting them. Only in recent years had more scientific methods prevailed. During a second day's conference methods of planning lighting installations were described, and special problems met with in engineering and textile factories were discussed by Mr. H. Lingard. The Conference was terminated by a visit to the works of Alfred Herbert, Ltd., at Coventry, where lighting has been closely studied and installed with a view to ascertaining the methods most conducive to maximum efficiency. Similar Conferences are in prospect in the autumn in Manchester (October 6-7), and possibly in Halifax.

The Testing of Flashing Lights

Experiments with different forms of flashing signal lights have been conducted for some time by Mr. Leslie G. Toplis, a member of the Illuminating Engineering Society, some of whose devices were exhibited by Sinterae, Ltd., at the Engineering and Shipping Exhibition last year.

Intermittent flashes are used in marine signal lights chiefly as a means of identification. But the question which type of flash renders a light most conspicuous at a distance is also well worth study, not only in regard to signal lights used at sea but also those intended for the guidance of aircraft. The problem is a somewhat intricate one, as not only the effect in fog but also the physiological effect of different intervals and periods of flicker (in some cases perhaps most easily perceived by the peripheral region of the retina) have to be considered.

It is evidently slow work if one has to explore all such effects with sources of light actually in position and with mists of varying thickness. Mr. Toplis hopes, however, by means of a special form of photometric device based on the familiar grease spot photometer, to get useful results in the laboratory: experiments so far conducted have confirmed practical experience.

According to this method a standard comparison light illuminates one side of the grease spot disc and the flickering light the other. By varying the intensity of the steady illumination and observing the characteristics, i.e., distinctive effect of the flickering light against the luminous background, which in some degree resembles the effect of a mist in practice, comparative numerical data can be obtained.

The method, however, cannot so easily be applied to tests with devices in which the flicker is produced by alternately extinguishing adjacent lights, instead of alternately exposing and revealing a single lamp. The former method is believed to be the more effective owing to the sideways displacement as well as the velocity with which the sector moves across the light; but these effects cannot easily be represented in the laboratory.

Illuminating Engineering Society

Silver Jubilee Commemoration (1934) Award

We have been asked to remind readers of the above award which is available annually for any member, associate, or affiliated student under twenty six years of age. It is awarded in recognition of (1) a paper on illuminating engineering, (2) the design or construction of a novel instrument for research on illumination, or (3) the carrying out of some research of benefit to illuminating engineering. Such work need not have been done for the I.E.S.—it might be done for any society or firm in this country and merit is the only consideration. The award consists of five guineas and a certificate. Evidence of such work should be sent in by competitors not later than the end of May, 1936.

Modern Fitting Design

We reproduce above another example of modern methods of fixture design. This fitting was designed by the Lighting Centre, Ltd., in conjunction with the architect, Mr. Frankland Dark, F.I.A.A., for the Board Room at Messrs. Edmundson's Electricity Corporation's Offices (Thames House, Millbank, London). The fitting is designed to light the full length of the Board Room table and is in keeping with the modern design of the room.

Another Census of Accidents

During the next twelve months, it is reported, every road accident involving injury is to be recorded at the Ministry of Transport, and the contributory causes (which have been classified under sixty-four heads!) analysed so that some fairly formidable work will be involved. No doubt accidents occurring by night and by day will be separated. We also hope that some effort to get information on accidents due to inadequate lighting will be made. It is now many years since the late Mr. L. Gaster suggested that every fatal accident in the streets should be studied as fully as fatalities on railways. But experience has shown that it is by no means easy to draw accurate conclusions in regard to the effect of lighting.

News from Holland

As readers of this journal are aware, there is a well-established Illuminating Engineering Society in Holland. We learn from Dr. N. A. Halnertsma that their annual meeting took place on the 24th of last month. A new departure was made on this occasion. It was decided, for the first time, to follow the example of the Society in this country, and to arrange a display illustrating progress in illumination. A number of manufacturers and importers of equipment took advantage of the opportunity to give short demonstrations of novelties. Some of these, such as the Terrey angle-poise lamp and the Weston automatic switch for public lighting, are familiar in this country. A novelty of French origin, however, was a device involving the provision of an ultra-black background for signs, extreme contrast being obtained by the addition of dark-coloured louvres, which prevent any reflection of light. White letters, it is stated, stand out very vividly against such a background, both by daylight and artificial light. The series of demonstrations was considered a great success, and it is hoped next year to repeat the experiment on a larger scale.

Sodium Lamp Development

We also learn that the new Philips super high pressure mercury lamp, consuming 90 watts and yielding 3,000 lumens, which was shown before the Illuminating Engineering Society in London last autumn, was on exhibition at the Dutch Industries Fair, which took place in Utrecht early in March. A feature was the display of such lamps, in combination with incandescent lamps, yield mixed light of suitable colour. It has just been decided that the main road between Haarlem and Amsterdam, which is eight miles long and carries a daily traffic of about 5,500 cars, shall be lighted with 385 sodium (100-watt) lamps mounted 30 ft. high and spaced 115 ft. apart. The Dordrecht Ferry has been for some time maintaining large sodium lamps on each of the landing stages. Such lamps, which, on account of their colour, are easily distinguished from other lights along the bank, have proved helpful in enabling a more regular service to be maintained during foggy weather.

Fifty Doctors Study Lighting

We hear that fifty doctors, who were taking a post-graduate course at the School of Hygiene and Tropical Medicine, recently attended the E.L.M.A. Lighting Service Bureau, in order to hear a lecture by Mr. W. J. Jones on the lighting of schools, offices, and factories—a topic of special interest to medical officers of health. Anything that can be done to interest the medical profession in illumination is well worth while. It is usually easy to influence the trader by showing where good lighting pays. It is more difficult to establish a general belief that it is necessary as an essential to health.

Railway Station Lighting

We are indebted to Mr. J. R. Hepple, of Newcastle-upon-Tyne and Gateshead Gas Company, for the above illustration showing a new lighting installation at the Benton railway station. The platforms are illuminated by four-light Rochester lamps, spaced 50 feet apart, 16 feet from the platform edge. The height of the mantles is 11 ft. 6 in. and there is an overhang of 3 ft. 3 in. All are fitted with Sugg distance control. The illumination on the platform edge between lamps is 0.35 foot-candles and, as the photograph suggests, the station appears quite brightly lighted. It has been the subject of favourable comment by local passengers.

Lighting Printers' Type

A report on Lighting in the Printing Industry, which appears in the last issue of the Transactions of the Illuminating Engineering Society (U.S.A.) records values of illumination for various processes observed in printing works. These seem to be in general accord with good modern practice. An average of 15 and a maximum of 45 ft.-c. is recorded for typesetting and an average of approximately 50 ft.-c. for proof-reading. Of special interest, however, is the study of methods at once avoiding glare from type and enabling it to show up well—a vital feature which has scarcely been sufficiently explored in this country. Glare from bright type is bound to be a difficulty so long as lighting from individual sources of high brilliancy is adopted. The solution is to be found in well diffused light coming from relatively large luminous areas. The illustrations accompanying the report show large hoods with whitened interiors above imposing tables. The hood contains several lamps mounted in spherical reflectors, so that all light is directed upwards on to the whitened interior and the table receives only indirect and diffused light. Directions for the positions of sources for other printing jobs—for example, so as to illuminate the bed of the press without glare—are also given

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County Hall No. 2.

Although it cost £4,000,000, the present London County Hall on the Embankment is too small—Oh, far too small! Accommodation is needed for nearly 5,000 members of the staff at present housed in scattered offices in Westminster. A new building, estimated to cost another million, is, accordingly, to be erected on the other side of Belvedere-road. The lighting should furnish good opportunities.

Fig. 1. Illumination of Palace of Versailles by means of projectors mounted on roof, creating shadows similar to those cast by the sun.

Fig. 2. Another view of the Palace illuminated by methods similar to those illustrated in Fig. 1.

Floodlighting the Palace of Versailles

Dr. Merry Cohu, Director of the Research Department of the Société pour le Perfectionnement de l'Eclairage in Paris, has kindly sent us this illustrated description of recent experiments on the floodlighting of the Palace of Versailles. The pictures show interesting comparisons of two systems of lighting, by means of standard projectors at ground level, and by the aid of special cylindrical apparatus located on the roofs.

FOR several months experiments on the floodlighting of the façade opposite the Court of Honour and the gardens of the Palace of Versailles have been in progress. This installation is intended to be put into operation during the International Exhibition of 1937, and it is hoped will be retained subsequently for permanent use.

The problem is one that requires special care in view of the massive width of the architecture, and their artistic ensemble and historic associations which render quite inadmissable anything that could be considered to be in bad taste. Tests have already been conducted by a number of firms and by different methods, the object being to study various technical alternatives, and especially to determine whether the desired effects could be secured by using sodium vapour lamps.

The Compagnie des Lampes was recently asked to install, as a basis of experiment, a double system of lighting enabling comparisons of the effects obtained with projectors mounted respectively at ground-level and on the roofs. These tests, like others preceding them, were limited to the façade opening on the Court of Honour, and made use only of incandescent lamps furnishing approximately white light.

The accompanying photographs illustrate very clearly the difference in effect of the two systems. Lighting from below is characterised by apparent lack of shadow, and gives an impression of monotony, which is the reverse of artistic. The lighting effected from the roofs, on the other hand, has been devised in such a manner that without the beams of light from the projectors being themselves visible, shadows are produced which reveal in relief the masses of the battlements, and create an effect resembling that of sunlight.

One test, which can readily be applied, is very conclusive. This consists in masking by means of a strip of white paper the black sky which appears in the photograph taken by means of lighting from

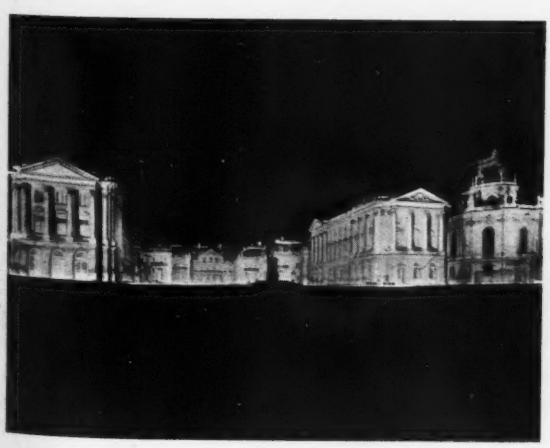


Fig. 3. Uniform and somewhat monotonous illumination from projectors mounted at ground level.

Fig. 4. Illumination by projectors situated on roofs. All the battlements are clearly revealed and the architectural features stand out in relief.

the roofs. One perceives immediately that it is difficult to distinguish the photographs taken from the same viewpoint by day and by night.

It may be mentioned that in the course of these experiments a new type of projector was put into use for the first time. This type has the double advantage that lamps of high candle-power can be used, and that the angle of dispersion of the beam can be precisely regulated to within a few degrees. It also makes possible a very intense beam, directed from a single point, and facilitates the imitation of the actual effect of sunlight on the faces of buildings, which is being so keenly sought after at the present moment.

The nature of this projector will be understood from the accompanying illustration (Fig. 5). Its essential feature is a cylindrical chromium plated mirror, and reinforced by plates of silvered glass. It houses two lamps with linear filaments situated along the axis of the cylindrical mirror. The rays reflected from the mirror all return through the filament, and are then directed by the silvered glass strips, which can be inclined at will to give a beam of any desired dispersion.

The model used at Versailles was equipped with two 3-kw. lamps (it can, however, receive two lamps of 5-kw. each); the lateral dispersion of the beam was approximately 150°, and the vertical dispersion about 5° only.

Mirrored glass projectors of the X-ray type using 500-, 1,000-, and 1,500-watt lamps have also been used.

In all, 60-kw. was used for the projectors mounted at ground-level, and 80-kw. for those situated on the roofs.

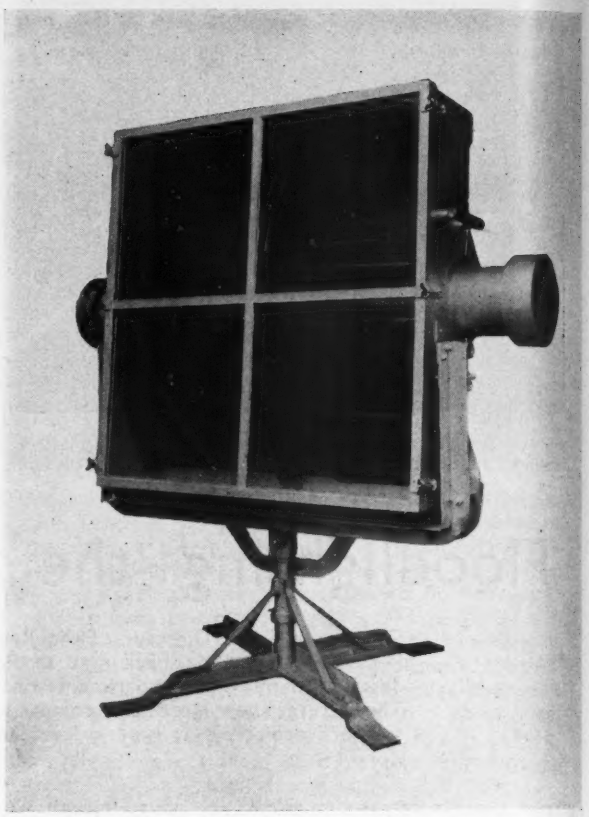


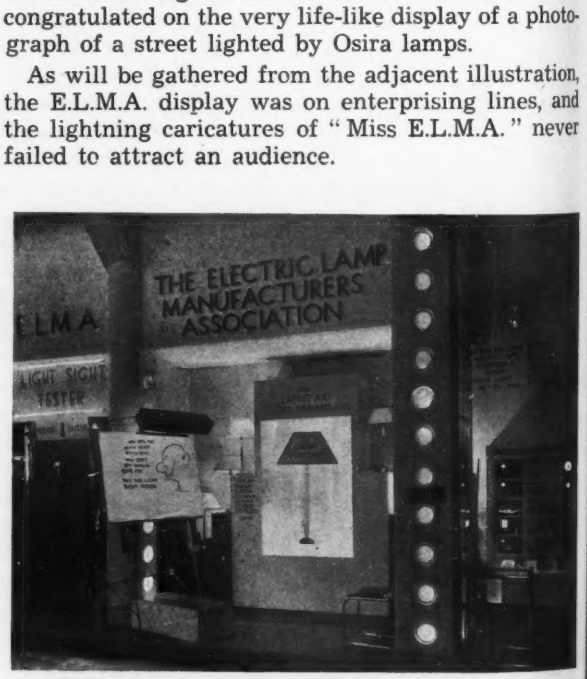
Fig. 5. The Special Form of Projector using two linear filament 3 kw. lamps, with cylindrical mirror and deflecting mirror glass vanes.

At the Ideal Home Exhibition, Olympia

The complete blacking out of daylight by an opaque overhead canopy at the Ideal Home Exhibition this year was rather a formidable project. It rendered possible the phrase "The City of Beautiful Night" and enhanced the appearance of the central illuminated tower and the floodlighted scenery round the gallery. But even in these days it seems a waste to eliminate daylight entirely. In the garden section—where the transition from a pleasing scenery background to the flowers in the foreground was even more cunningly contrived than usual—the admission of diffused daylight through muslin overhead was welcome. An interesting feature was the use of fluorescent material, which shone out a vivid green under exposure to ultra-violet rays, on the spire of the central tower. Ordinary floodlighting, it is stated, would have spoiled the night-sky effect.

To our mind the gardens are always the most *pleasing* exhibit, but there was as usual much of interest in the lighting section, where both gas and electric lighting were well represented. The display of "planet" type fittings in the gas exhibit was a novelty, and at adjacent stalls of electric fittings manufacturers some pleasing designs (some of which we mean to illustrate shortly) were to be seen. The small model rooms, in which different types of modern lighting could be switched on at will at the B.T.H. stand was a good feature, whilst the designers of the G.E.C. stand should be congratulated on the very life-like display of a photograph of a street lighted by Osira lamps.

As will be gathered from the adjacent illustration, the E.L.M.A. display was on enterprising lines, and the lightning caricatures of "Miss E.L.M.A." never failed to attract an audience.



A view of a section of the E.L.M.A. display at the Ideal Home Exhibition. In the foreground, on the blackboard, is one of the ingenious sketches with which "Miss E.L.M.A." entertained spectators. In the background, there are exhibits relating to the Study Lamp, the Science of Seeing, and the "Light-Sight Tester."

By courtesy of the "Railway Gazette."

Fig. 1. A striking view of the appearance of the new L.N.E.R. Marshalling Yard at Hull, showing the lighting in the neighbourhood of the control tower.

The Lighting of a Railway Marshalling Yard

An interesting example of railway yard lighting is afforded by the recent installation at Hull in the new marshalling yard of the L.N.E.R. This yard is constructed on the "hump" principle, in which the sorting of wagons is arranged by allowing them to gravitate from the top of the hump and turn into the particular siding required by a setting of the various points, which are operated from a single control tower.

The above illustration (Fig. 1) shows the lighting in the neighbourhood of the control tower and the diagram (Fig. 2) indicates the general principle of the lighting. This has been carried out by 1,000-watt floodlights as far as possible so as to avoid a multiplicity of lighting poles, but it has been found desirable to supplement the floodlights with 300-watt lamps in ordinary directive reflectors at various important parts of the layout. In addition, special lighting has been arranged by means of floodlights directed transversely across the line of the rails for showing up the wagons as they pass from the hump to the sidings. It is the practice in yards of this kind to install braking in order to retard the speed of the trucks when passing into the sidings, and the area in which the brakes are fixed is well lighted by means of this transverse floodlighting.

The floodlighting units, two of which are double-banked, are of the 1,000-watt weatherproof type, and are mounted on the top of 55 ft. steel poles equipped with ladders and platforms for maintenance purposes. The reflector units equipped with 500-watt or 300-watt lamps are fitted on similar poles at a height of about 30 ft.

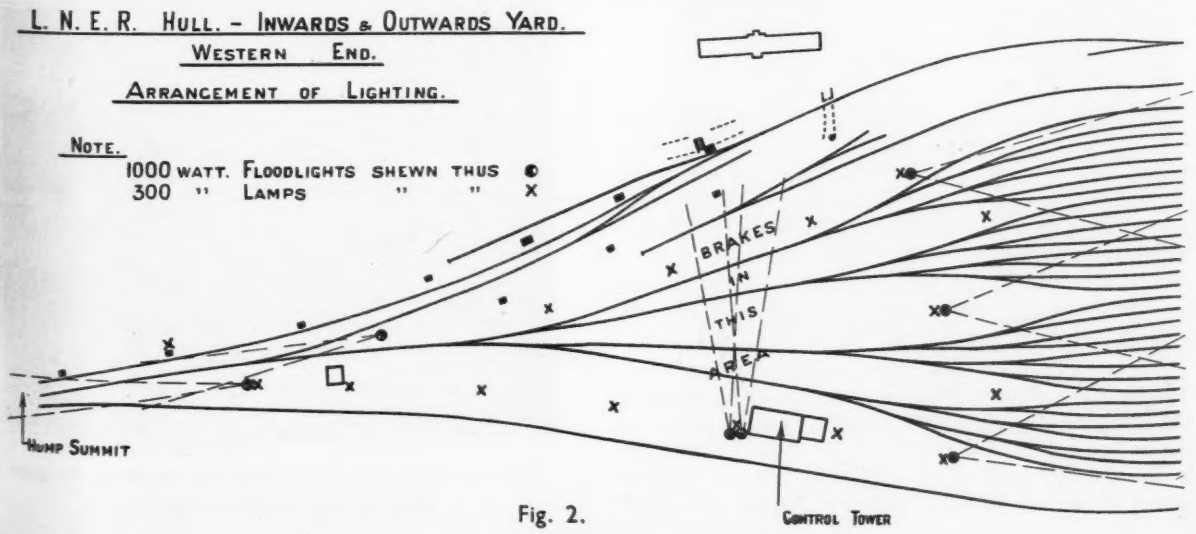

L. N. E. R. HULL. – INWARDS & OUTWARDS YARD.
WESTERN END.
ARRANGEMENT OF LIGHTING.
NOTE.
1000 WATT. FLOODLIGHTS SHEWN THUS ⊙
300 " LAMPS " " X
BRAKES IN THIS AREA
HUMP SUMMIT
CONTROL TOWER

Fig. 2.

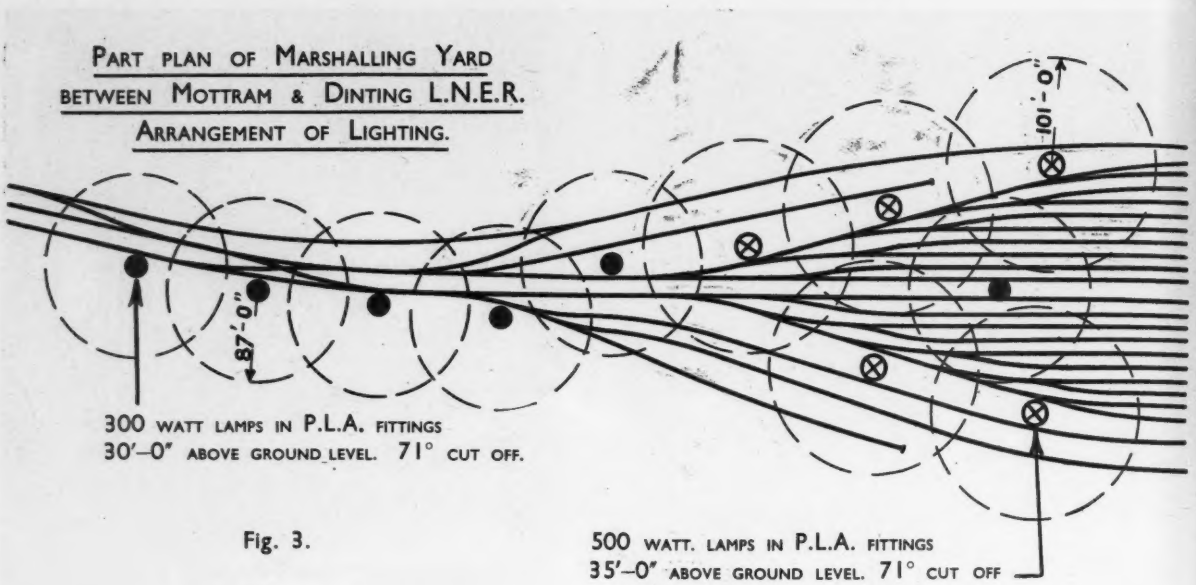

PART PLAN OF MARSHALLING YARD
BETWEEN MOTTRAM & DINTING L.N.E.R.
ARRANGEMENT OF LIGHTING.
87'-0"
101'-0"
300 WATT LAMPS IN P.L.A. FITTINGS
30'-0" ABOVE GROUND LEVEL. 71° CUT OFF.
500 WATT. LAMPS IN P.L.A. FITTINGS
35'-0" ABOVE GROUND LEVEL. 71° CUT OFF

Fig. 3.

It is still somewhat a moot point whether flood-lighting is altogether desirable for lighting of marshalling sidings, on account of the tendency to glare in the eyes of the staff when looking up the beam. The reduction in the number of lamp posts is, of course, a valuable feature, but where the layout can be planned to include a reasonable number of posts, ordinary dispersive reflector units are very satisfactory.

The above diagram (Fig. 3) shows an arrangement of such reflectors which has been adopted at another yard (Mottram and Dinting). The results have proved that this system can be very effective, and glare is entirely eliminated owing to the sharp angle of cut-off. The lighting units in this case are similar to those described and illustrated in the article on "Lighting of a Fish Dock," which appeared in our April issue, and consist of single-piece silvered mirror reflectors housed in substantial copper spinnings and with ample provision for ventilation and weather-proof entry of the wiring. The silvered mirror reflectors are fitted in woven asbestos rings to avoid jar, and the whole fitting is of a simple type with an adjustment for light centre enabling the cut-off to be varied from 65 deg. to 71 deg.

As arranged at Mottram and Dinting, the reflectors are mounted at a height of 35 ft. for 500-watt lamps and 30 ft. for 300-watt lamps, and with a 71 deg. cut-off, the overlap of each unit gives effective lighting as shown in the diagram The illumination values obtained at ground level vary from 0.74 foot-candle to 0.13 foot-candle. We understand that the whole of these lighting fittings were supplied by the General Electric Co., Ltd.

We are indebted to the "Railway Gazette" for the use of the illustration (Fig. 1), showing the general appearance of the installation at Hull, which was described in that journal on January 24.

We have also to acknowledge the courtesy of the Chief Mechanical Engineer of the London and North-Eastern Railway (Mr. H. N. Gresley) for permission to make use of data respecting this installation, and congratulate him and his staff on the very effective lighting that has been provided.

Railway Station Lighting

Improved Gas Lighting at Sheffield

The recent adoption of new gas units has effected a very material improvement in the lighting of Sheffield Railway Station. The new lamps include about seventy 4-, 5-, and 6-light "Littleton" outdoor lamps, each of which is fitted with a distant control device. Special arrangements have been made to allow for sectional lighting and extinguishing on the various platforms, each section being operated by a conveniently placed control tap.

The two illustrations on page 141 give an indication of the great improvement effected. Attention may be drawn particularly to the greater ease with which the edge of the platform can now be seen. This is again illustrated in the adjacent picture (Fig. 1), which shows the effect of the new system.

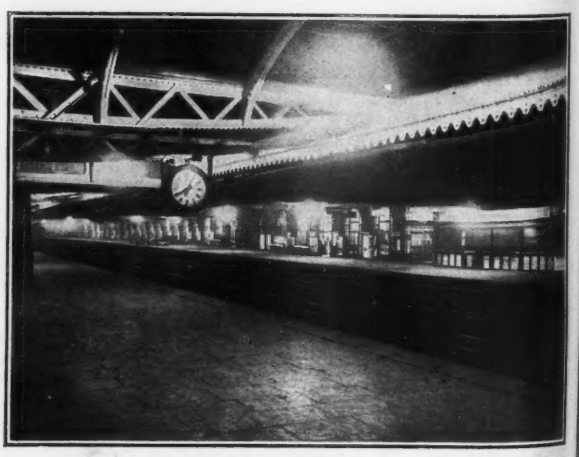


Fig. I. A view of a station platform showing the good effect of the improved lighting.

Overhead Lighting in the Strip Mills of Messrs. Arthur Lee & Sons, Sheffield.

Another example—The Works of Messrs. Thos. Dryden & Sons, Ltd., Preston.

Overhead Lighting with Electric Discharge Lamps

Much is constantly being written about the uses of electric discharge lamps for public lighting. Even now the extent to which they are applied for industrial lighting is hardly sufficiently realised. Apparently the colour of the light does not operate as a drawback (except, of course, in certain cases in which accurate representation or matching of colours is concerned). In many cases it seems to be a positive advantage in revealing details less easily seen by ordinary light, and the diffusion from these forms of lighting units is a good feature.

We are indebted to Metropolitan Vickers Electrical Co., Ltd., for the two excellent illustrations of overhead lighting in large works in the North, which appear above. In works of this nature it is a great advantage to keep the lights well up, so that there is a clear view from one end of the room to the other, and a completely clear space for the movements of machinery. The photographs suggest that the visibility is excellent, and that the ground-illumination is ample—an important consideration in works of this nature where accidents, owing to men stumbling over objects on the floor, might otherwise occur.

Improved Lighting in Sheffield Railway Station

(continued from p. 138).

A platform at Sheffield Railway Station with the original gas lighting.

The same platform as it now appears with the improved gas lighting.

Principles of Street Lighting

Some Notes on a recent paper read by Mr. G. H. Wilson, Mr. E. L. Damant and Mr. K. J. M. Waldram, before the Institution of Electrical Engineers.

The title of this paper, recently read before the Institution of Electrical Engineers ("The High Pressure Mercury Vapour Lamp in Public Lighting") afforded scope for a description of electric discharge lamps and equipment used therewith and a considerable part of it was devoted to descriptive data, polar curves, etc. The most interesting section of the paper in some respects was, however, the final one in which principles of street lighting were discussed.

Observation by Silhouette.

The authors suggest that by artificial light, as by daylight, objects are almost invariably darker than their background and are seen in silhouette. (The good visibility of objects on the skyline is proverbial.) It is true that other surfaces besides the road-surface may form a background, but the latter is much the most important.

The polished surfaces of modern roadways result in the formation of bright patches associated with the light sources which are "T-shaped" with the "tail" centred about the line adjoining the source and the observer. It is necessary so to locate and design the lighting units as to produce bright areas sufficiently long and wide to coalesce and provide a background of sufficiently high and uniform brightness for all objects to be clearly revealed. The distribution of brightness naturally changes with changing position of the observer; the art of design consists in securing that the important part of the road remains covered by bright areas from all relevant points of view.

Uniformity of Brightness.

It is necessary to select a standard viewpoint. As a rough measure of the brightness level in existing installations the authors take the brightness-level of the road surface which forms a background to objects 200-300 feet distant when seen by an observer under one post, with his eye 5 ft. high and at 10 ft. from the kerb. This is called "effective brightness."

The degree of non-uniformity which can be tolerated on the roadway is much smaller than might be supposed. A diversity of 2 or 3 to 1, which is inappreciable in an interior lighting installation or in floodlighting, is very noticeable in a street. With a diversity of 10 to 1 detail is beginning to be lost. A diversity of 5 to 1 over the significant part of the road may be taken as a rough limit. The least safe road surface brightness level cannot definitely be laid down, but it is suggested that about 0.1 equivalent foot-candles is necessary in order to satisfy road users of the presence or absence of objects.

Very bright sources can doubtless give rise to troublesome glare; but in general glare is most dangerous on badly lighted roads. Apart from "disability glare" the distracting and worrying effect of bright sources ("discomfort glare") should not be overlooked, though its measurement presents difficulties.

Limitations of Cost.

Cost is naturally a vital element in street lighting. An ideal installation might possibly consist of a great many entirely concealed sources producing high visibility over the whole of the carriage-way and footway. Since, however, this cannot be afforded at present the system of using relatively few exposed sources, of small power and dimensions and at comparatively great spacings, has to be retained. On the whole an installation using high posts and spacings up to 150 ft. is less costly than one using lower posts at smaller spacings. Little extra cost is involved in going from 18 ft. to 25 ft. in height. There seems, however, to be no great advantage in exceeding this upper value.

An Optimum Installation.

In conclusion the authors present the following specification of the optimum installation for a main traffic route, in which a moderate volume of traffic moves at the highest permissible speed (usually 30 m.p.h.) and having ordinary characteristics as regards surface:—

(1) *Mounting Height.* About 25 ft.

(2) *Arrangement of Posts.* Nominally staggered, but varied where necessary for curves and crossings. The "5° rule" to be adhered to as far as possible.

Where funds permit, much better results can be obtained if the staggered system is doubled to form an opposite system.

(3) *Width between Rows of Sources.* Not exceeding 30 ft.

(4) *Overhang from Kerb.* For carriage-ways not exceeding 30 ft. in width, and for sources 25 ft. high, overhang is unnecessary and in some ways undesirable. Where the width exceeds 30 ft. an overhang up to but not exceeding 6 ft. is beneficial. For good results, roads more than 45 ft. wide require three rows of sources.

(5) *Spacing.* On straight roads, the average spacing of sources in one row should not exceed 300 ft., and should preferably be less. On bends, etc., it may be desirable to transfer the sources all to the outside of the bend, in order to satisfy the "5° rule," and the spacing may well be reduced to 100 ft. or even less on sharp bends. The maximum spacing between any individual pair of sources in one row should not exceed 350 ft.

(6) *Light Distribution.* Approximating to the requirements in col 1 on this page.

(7) *Light Output.* At least 3,000 lumens per 100 ft. run, and preferably twice this value, should be provided in each row of sources. (This is provided by 250-watt or preferably 400-watt H.P.M.V. lamp at 300 ft. spacing in each row.)

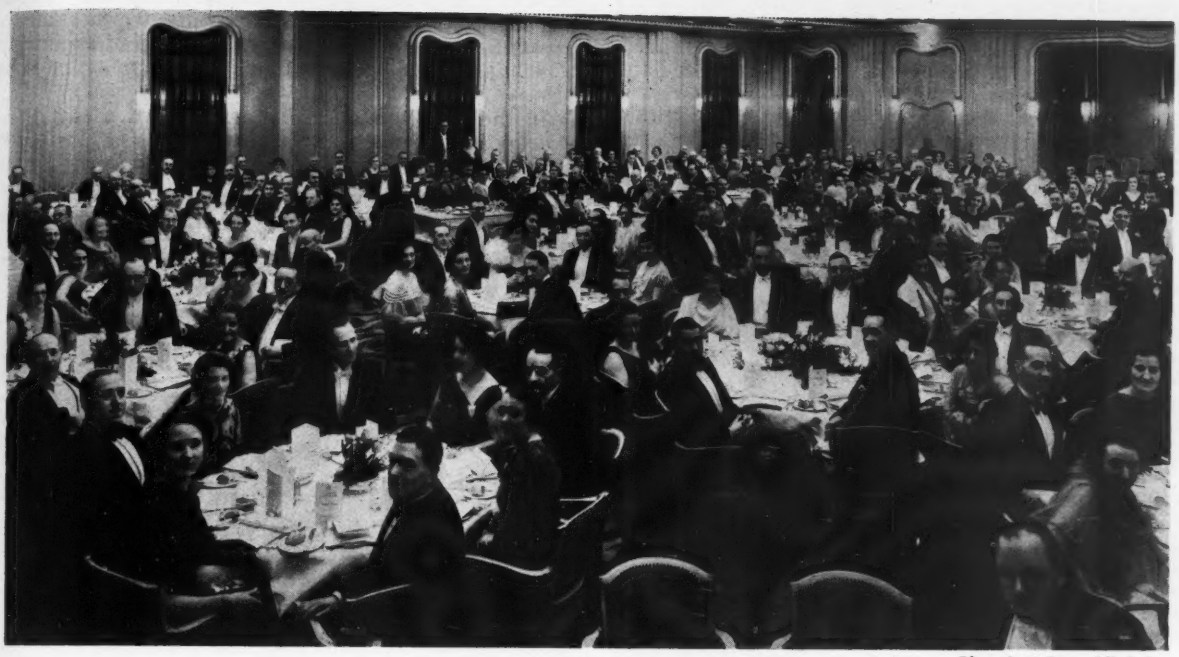


Photo by "Rawood," Ltd.

This photograph, was, as usual, taken during the dinner without flashlight, and by the actual illumination in the room only. In the background, The President (Mr. A. W. Beuttell) is standing. On his right is Mr. J. M. Kennedy, the President of the Institution of Electrical Engineers, and on his left, Mrs. H. D. Beuttell, who acted as Hostess, and Colonel W. Moncrieff Carr, President of the Institution of Gas Engineers.

The Illuminating Engineering Society's Annual Dinner

This Annual Dinner, held at the Trocadero Restaurant (Piccadilly, London, W.1), at 7.30 p.m. on March 24th, was again an outstanding success. The attendance (approx. 320) passed the 300 mark for the first time, and once more "all records were broken."

IT will be recalled that the annual dinner of the Illuminating Engineering Society, which was originally fixed for February 11, was postponed owing to the death of King George, and the event was deferred until March 24. To those who were present on that date it was clear that the popularity of the event had not suffered through the postponement, as there were, in fact, about seventy more people present than in 1935, and the 300 mark was passed for the first time in the history of the Society.

Among the guests of the Society were: Mr. A. Maurice Bell (President of the Association of Public Lighting Engineers), Col. W. Moncrieff Carr (President of the Institution of Gas Engineers) and Mrs. Moncrieff Carr, Major-Gen. A. E. Davidson (Past President of the Institution of Mechanical Engineers) and Mrs. Davidson, Mr. E. Stanley Hall (Vice-President of the Royal Institute of British Architects), Mr. J. M. Kennedy (President of the Institution of Electrical Engineers) and Mrs. Kennedy, Sir David Munro (Secretary of the Industrial Health Research Board) and Lady Munro, Mr. H. W. Swann (Senior Electrical Inspector of Factories) and Mrs. Swann, and Mr. A. E. Turville (Chairman of the Institute of Ophthalmic Opticians) and Mrs. Turville.

Past Presidents of the Society were represented by Sir John Herbert Parsons, Mr. D. R. Wilson, Mr. C. C. Paterson, Lt.-Col. Kenelm Edgcumbe, Mr. C. W. Sully, and Mr. H. Hepworth Thompson.

"The Illuminating Engineering Society."

The usual loyal toast having been duly honoured, the toast of "The Illuminating Engineering Society" was proposed by Mr. J. M. KENNEDY (President of the Institution of Electrical Engineers).

After a brief reference to early days of gas lighting and a cartoon of 1870, Mr. Kennedy contrasted the conditions of the past with those prevailing to-day, when all agencies were vieing with each other to give greater and greater illumination for less money. Illumination was now being studied, not only with regard to the efficiency of the source of light itself, but also as regards its effect on objects of illumination and its relation to vision.

One question that would have to be faced ultimately was whether to reproduce the colour of natural light or whether, from economic or other reasons, to settle on standardisation on some different basis such as would cause all colours to appear differently by artificial light than they do in daylight.

The field of investigation was very much wider to-day. At the outset the electrical industry had to solve one technical problem—that of finding out how to generate and distribute electricity. To-day there were many problems, of much wider scope and in many ways more interesting, embracing both economics and psychology. Consideration of the economic aspect had led to the introduction of the

two-part tariff. With the installation of separate meters for lighting and heating the risk that lamps might be connected to the heating circuit—easily effected by means of plug-adapters—had to be faced, and there were now other uses such as rendered the adoption of a single meter almost imperative. It was unfortunate that as a result it was now difficult to assess with accuracy the quantity of electricity used for lighting purposes. It was known, however, that the quantity was increasing very rapidly and that there was still a great potential demand.

In conclusion, Mr. Kennedy urged the need for close co-operation with architects who could do so much to further the various uses of lighting, and commented on the recently introduced "study lamp" as an excellent device. The investigations which the Society was making were bringing to light the need for a greatly increased standard of illumination in our homes and offices, shops, and factories, and last, but not least, on our roads.

Mr. A. W. BEUTTELL (President of the Illuminating Engineering Society), in response, referred with pleasure to the presence of the Presidents of the Institutions of Gas and Electrical Engineers—which might be regarded as parents—as an appropriate recognition of the Society's desire for contact with these two great industries, which furnished the raw material for its work.

He referred to the progress made by the Society in several notable directions—to its increased membership and to such new departures as the publication of its Transactions, the formation of new Special Sections, and the initiation of efforts to build up a library. Another event of the past year was the very fruitful Ninth Session of the International Commission on Illumination in Germany; this was attended by fifty-three British delegates (by far the largest visiting delegation), of whom forty were members of the Society. These were instances of things accomplished.

He also wished to make some reference to some things that had not yet been done. He emphasised the vital importance to the community of the lighting industry, essentially a home industry and one which embodied a great variety of trades and callings, all interested in the technique of lighting.

To concerns providing equipment for the gas and electrical industries, and to the producers of gas and electric energy this technique was of evident interest. Yet it appeared that comparatively few of them yet employed specialists to solve their lighting problems.

This subject, moreover, could not be divorced from the practice of many other professions, and it was of interest to many large users, including Government Departments and bodies concerned with public service, few of which seemed to be yet alive to the need for having within their own organisation men with specialised knowledge of illuminating engineering.

Therefore, not the least of the things yet to be done was to establish in the minds of all these groups the economic and technical value of the specialist, and to organise the supply of fully trained men to meet the demand. This would seem to be primarily the work of the Society, the home of specialists, but it needed the more sympathetic co-operation of those to whom it was addressing this task.

When one looked at the wide field and extended ramifications of the lighting industry one could not help thinking that it needed knitting together, that it required some form of common council drawn from its contributory bodies to think for it as a whole. As an instance of a problem requiring broad consideration of this kind, he mentioned electrical tariffs, which stood at the root of progress of the electrical side of the lighting business but affected the interest of every section of it.

In connection with this matter of promoting general co-operation, there was the question of co-operation with other interested societies, such as the Association of Public Lighting Engineers. Similarly, it was hoped that the contemplated Special Section to deal with architectural lighting would help to enlist the interest, sympathy, and help of architects. The aid of consulting engineers should be enlisted by similar methods.

In the final portion of his address, Mr. Beuttell remarked that there was one feature of the Society in which it could feel some pride—its success in enabling two such earnest competitors as the representatives of gas and electricity to enjoy each others company under a common roof. The Society's house was, indeed, one of many mansions, and not the least of its functions was to create those bonds which he hoped and believed would always keep its members together as a happy family. Therein lay the secret of the results they had been able to achieve; in that and in a hard-working council and committees and an irreplaceable honorary secretary and his staff—the two ladies well known to all of them who seemed to have consecrated themselves to the welfare of the Society!

"The Guests."

Mr. A. CUNNINGTON (Vice-President), in proposing this toast, remarked that it was a tradition of the Society at its annual dinner to welcome guests representative of kindred institutions. Such co-operation was very desirable in the interests of progress. Apart from the main engineering and industrial aspects of lighting elements involved in "The Science of Seeing" should not be overlooked. The appeal to the eye as concerned with the illumination of buildings was represented in the presence of Mr. Stanley Hall, a Vice-President of that very august body, the Royal Institute of British Architects. He hoped that as a society yet young, but now twenty-seven years of age, the Society might, with deference, describe itself as a sister to the Institute, and that co-operation with it would grow closer in years to come.

In regard to the physiological aspects of lighting and the eye itself, it was a pleasure to welcome Sir David Munro, secretary of the Industrial Health Research Board, and Mr. A. E. Turville, Chairman of the Institute of Ophthalmic Opticians. If he might deviate for a moment from allusions to the Society's honoured guests, he would like just to draw attention to the number of past presidents of the Society who had attended, and particularly to the presence of Mr. D. R. Wilson, the Chief Inspector of Factories; it afforded an opportunity of paying tribute to the very valuable work on behalf of industrial lighting being done by the Home Office Factory Department.

The President had alluded to the presence of Mr. Kennedy and Colonel Carr, and he had listened with great pleasure to the remarks of the former. At one time it would have been considered a miracle to induce representatives of gas and electric lighting to work together—he would not say as the lion and the lamb, but, rather, father and mother—though nothing would induce him to say which was which! One thing that had undoubtedly helped was the common interest that both had in street lighting, in which the Association of Public Lighting Engineers was professionally interested.

He had, therefore, great pleasure in proposing the toast coupled with the names of Colonel W. Moncrieff Carr, President of the Institution of Gas Engineers, and Mr. A. Maurice Bell, President of the Association of Public Lighting Engineers.

Colonel W. MONCRIEFF CARR (President of the Institution of Gas Engineers) remarked, though he had accepted with pleasure the invitation of the Illuminating Engineering Society to attend as their guest, he had, in fact, recently become a member of the Society. It could be claimed that gas was the mother of advanced lighting, but he would grant paternity to Mr. Kennedy! In this Society gas and electric interests were united in a common effort on

behalf of better lighting. The need was great. The cry of new lamps for old was still necessary in many quarters. There were still far too many authorities who were content with conditions that ruled forty years ago, but were no longer good enough. To remedy this state of affairs was the main interest of both industries.

Referring to Mr. Kennedy's reference to the early history of gas lighting and the provision of so many "candles," he, Colonel Carr, could assure him that the candles were still alight! The Board of Trade returns showed, indeed, that in 1934 the amount of gas sold was, roughly, twice what it was in 1920. The competition between the two industries was somewhat too much to the advantage of local authorities. It should be their business to see whether co-operation would not be of service.

In conclusion, Colonel Carr said that he was particularly glad to note the encouragement which the Society offered to its junior members to read papers —not only before their own, but also before other societies

Mr. A. MAURICE BELL (President of the Association of Public Lighting Engineers) remarked that he, too, was a member of the Illuminating Engineering Society, though it was a pleasure to be their guest on this occasion. He was very happy to note the desire that had been expressed for cordial relations between the Society and the body which he represented. It was essential that both should work together in complete agreement and in close co-operation.

In conclusion, he expressed his appreciation of the work which Mr. Dow, during his connection with the Association of Public Lighting Engineers, had done for that body, and also of the efforts of his staff, and congratulated Mr. Beuttell on the excellent progress made by the Society during his period of office as President.

Illuminating Engineering Society. Programme for 1936-37

The present Session terminates this month, and arrangements for the 1936-37 Programme are already being made.

Offers of papers by members are now invited. Papers embodying the results of original research are specially desired, but others of a general, descriptive, or statistical nature will also be welcome.

All papers read before the Society are eligible for the Leon Gaster Memorial Premium, which is awarded annually.

Snapshots by Artificial Light

We are indebted to Mr. E. Stroud for the accompanying snapshots, which were taken during the annual dinner of the Illuminating Engineering Society, by the aid of the ordinary artificial light only, and with an exposure of one second. (Aperture, F. 2.9.)

Mr. E. Stroud and Mrs. Stroud in the foreground.

Taken at the I.E.S. Annual Dinner

Such pictures illustrate the progress in photographic equipment made during recent years, which have lessened enormously the difficulty of taking photographs of artificial lighting installations in which the figures of people appear.

Col. C. H. Silvester Evans and Mrs. Evans.

Mr. F. E. Lamplough and Miss Lamplough.

Literature on Lighting

(Abstracts of Recent Articles on Illumination and Photometry in the Technical Press)

(Continued from April, Page 123)

II.—PHOTOMETRY.

102. Colour Analyzer Plots Own Curve.

Anon. Electronics, 9, pp. 17-18, March, 1936.

The article describes a recording photo-electric spectrophotometer. An important feature is the independence of the measurements from characteristics of the light source and circuit employed. Measurements may be made on either transmitted or reflected light. S. S. B.

103. Precision Photo-Electric Colorimeter.

D. C. Broome and A. R. Thomas. El. Times, 89, pp. 417-419, March 26, 1936.

The instrument is described as divided into two portions: (1) A unit consisting of a high intensity light source controlled by a special form of rotary slotted diaphragm and including a set of spectrum filters covering wavelengths from infra-red to extreme violet, and (2) a second unit comprising a vacuum type photo-electric cell and one stage of valve amplification and including a precision potentiometer. Photographs and diagrams are given. The instrument has been applied particularly to the identification of bitumens, but several other uses are suggested, such as evaluation of coloured asphalts and paints and study of the light reflection characteristics of road surfaces. W. R. S.

104. The Dependence of Sensitivity of the Selenium-Sulphur Rectifier Photo-Electric Cell on the Obliquity of the Incident Light and a Method of Compensation Therefor.

G. P. Barnard. Proc. Phys. Soc., January, 1936, 153.

When a restricted portion of the surface of a cell is illuminated, the sensitivity increases as the small illuminated area moves away from the centre of the cell. If a suitable stop is arranged at a certain distance above the centre of the cell, then the loss of sensitivity due to obliquity of incident light is counter-balanced by the increased sensitivity due to the displacement of the illuminated area from the centre of the cell. S. E.

III.—SOURCES OF LIGHT.

105. Low Voltage Neon Tubes.

P. Freedman. El. Rev., Vol. CXVIII., No. 3,045, p. 487, April 3, 1936.

Describes a neon tube operating at normal household supply voltages. The discharge takes place between spiral wire electrodes extending the entire length of the tube, spaced from each other by insulators at intervals along the tube. R. G. H.

106. Absolute Intensities in the Spectrum of a Low Pressure Quartz Mercury Vapour Discharge Burner.

A. J. Maddock. Proc. Phys. Soc., January, 1936, 57.

Absolute intensities of the main spectral lines between 6,000 and 2,400 A given by a very low-pressure mercury vapour discharge burner are given and compared with those given by a high-pressure mercury arc. Therapeutic effects produced by the two types of burners are discussed. S. E.

IV.—LIGHTING EQUIPMENT.

107. Lighting Fittings.

Anon. Elect., 106, pp. 409-411, March 20, 1936.

Detailed descriptions with photographs are given of numerous lighting fittings, including floodlights, that are now available. C. A. M.

108. Flameproof Fittings.

Anon. Elect., 106, pp. 354-355, March 13, 1936.

A description, with a photograph, is given of a new flameproof lighting fitting now available. When used with a 200w. lamp, the maximum temperature attained on any part of the fitting is given as 60° C. C. A. M.

109. Resistant Glasses for Modern Electric Discharge Lamps.

J. H. Partridge. J. Soc. Glass Tech., 1935, XIX., 266.

Glasses suitable for the inner envelopes of high-pressure mercury discharge lamps have a softening temperature in the neighbourhood of 900° C., a minimum specific electric resistance of 2 megohms at 600° C., and a low iron oxide content. Thermal expansion, thermal endurance, and viscosity data are given for a number of experimental glasses. Some information is also given regarding glasses suitable for the inner envelopes of sodium discharge lamps. S. E.

110. Gas Lighting Control.

Gas Journal, April 15, 1936.

Contains a report of a paper relating to the use of photo-electric cells as applied to the control of gas lighting. J. G. C.

V.—APPLICATIONS OF LIGHT.

111. Thirty Foot-Candles, No Windows in Mill.

Roy A. Palmer. El. World, 106, p. 781, March 14, 1936.

The article gives some details and a photograph of an installation in a mill where artificial lighting alone is used, no windows being provided. S. S. B.

112. Testing Materials by Fluorescence.

J. A. Radley. El. Times, 89, p. 203, February 13, 1936.

An account of the values of ultra-violet light in testing electrical materials. Paper, oils, rubber, synthetic resin are among the subjects dealt with. W. R. S.

113. The Integration of the Glare Effects from a Number of Glare Sources.

B. H. Crawford. Proc. Phys. Soc., January, 1936, 35.

The effect of a number of glare sources on indirect vision, 5° above the fovea, is shown to be equal to the sum of their separate effects. S. E.

114. Lighting of the Château de Versailles.

Anon. R.G.E., 39, p. 397, March 14, 1936.

A brief account, with a photograph, of the floodlighting of the Château de Versailles. W. R. S.

115. Ideal Home Exhibition.

Anon. El. Rev., Vol. CXVIII., No. 3,045, p. 491, April 3, 1936.

Describes, with photographs, the novel lighting demonstrations and effects at the Ideal Home Exhibition at Olympia. R. G. H.

116. The Recent Electrical Installation at the Théâtre National de le Comédie Française, at Paris.

F. Vernet. R.G.E., 39, pp. 415-431, March 21, 1936.

Contains a full description, with photographs and diagrams, of the lighting for auditorium and stage. Cyclorama lighting is also discussed.

The article of the previous month also refers briefly to the lighting of parts of the theatre other than the stage. W. R. S.

117. Preset Stage Lights on Compact Console.

R. B. Hunter. El. World, 106, p. 790, March 14, 1936.

Details are given of a control board for operating stage lights, which utilises Thyratron tube rectifiers. A double control panel is provided, so that gradual or immediate change may be made from one setting to another. By means of templates, any number of schemes may be preset. S. S. B.

118. Hospital Lighting.

P. J. B. Harland. Elect., 106, p. 405, March 20, 1936.

The particular lighting requirements of wards and operating theatres in hospitals are dealt with in detail. C. A. M.

ONLY VITREOSIL LIGHTING WARE GIVES THIS MARGIN OF SAFETY

Note the Vitreosil Test. Only Vitreosil Lighting Ware survives this ordeal. Any other lighting glassware, even though it passes the British Standard Specification Test, would be shattered by the shock of sudden cooling from red heat. This means a margin of safety far in excess of the needs of domestic or industrial lighting. It enables Vitreosil Globes, Bowls and Reflectors to be used on high-pressure and super-heated burners without the slightest fear of "flying."

Moreover, smaller shapes can be confidently used, thus concentrating the mantle heat and producing a brighter light which is softly diffused with the minimum loss by passage through Vitreosil.

There is unique beauty in the pearly lustre and satin-like surface of Vitreosil, and the patterns are designed for modern decorative needs.

VITREOSIL

Lists on request from the Sole Manufacturers—

THE THERMAL SYNDICATE LIMITED

Vitreosil Works Wallsend-on-Tyne.

London Depot: Thermal House, Old Pye St., S.W.1

GLOBES · BOWLS · REFLECTORS · · OF PURE FUSED SILICA

119. Railway Lighting.

Gas World, April 4, 1936, and Gas Times, April 11, 1936.

Contains an illustrated description of Railway Lighting at Sheffield.

120. New Light Technique Focuses Merchandise.

Anon. El. World, 106, p. 801, March 14, 1936.

It is claimed that by removing the lighting units from the field of view, the merchandise illuminated attracts the attention more, as it then becomes the brightest part of the field. Recessed reflectors have been adopted for a large San Francisco market. Intensities of from 20 to 60 foot-candles are claimed for the counters and displays, while up to 425 foot-candles is claimed for the show windows. Some details are given. S. S. B.

121. Modern Store Lighting.

Waldo Maitland. Elect., 106, p. 406, March 20, 1936.

The new lighting equipment of a London store is discussed in detail. C. A. M.

122. Parade Lighting.

Anon. Elect., 106, p. 429, March 20, 1936.

Details, with a photograph, are given of a new installation of parade lighting in South London. Seventy lamps of 1,000 watts are used. C. A. M.

Public Lighting in Edinburgh

We learn that the Corporation of the City of Glasgow have ratified the appointment of Mr. Edward J. Stewart as Inspector of Lighting in succession to Mr. S. B. Langlands and of Mr. James M. Ward to succeed Mr. Stewart as Assistant Inspector of Lighting.

Obituary

Sir Joseph Petavel, D.Sc., F.R.S.

The passing away of Sir Joseph Petavel, the Director of the National Physical Laboratory, on March 31, removes a respected and familiar figure from the world of science. Sir Joseph succeeded Sir Richard Glazebrook to this position in 1919, but prior to that he was a member of the General Board of the Laboratory, and he served on numerous Government and other scientific committees. He was very versatile in his interests—he was, for example, keenly interested in aerodynamics and radio problems—and took a leading part in movements for encouraging industrial research. In his early days at Manchester University he carried out original researches on high temperatures, and did work not only of considerable scientific value but of special interest to readers of this journal because of its bearing on the production of a primary standard of light.

We learn that, pending the appointment of a successor, the position of Director of the National Physical Laboratory is to be held by Sir Frank Smith, the Secretary of the Department of Scientific and Industrial Research.

A. E. Chapman

We learn with great regret of the death of Mr. A. E. Chapman, Managing Director of Tubelight Sales, Ltd., which occurred on March 27, after a protracted illness bravely borne.

Mr. Chapman was a member of the Illuminating Engineering Society, many of whom will recall his inventive ingenuity and the enthusiasm with which he developed his ideas. During the post-war era Mr. Chapman was identified with several neon enterprises, although more recently he was interested mainly in low tension filament vacuum tubular lamps. One of his inventions, the "Barlux" tubelamp, was a forerunner of the architectural striplite lamp. His indefatigable energy and technical skill were of great benefit to the company with which he was associated, and his loss will be widely regretted.

Recent Patents

(Abstracts of recent Patents on Illumination & Photometry.)

No. 442,259. "Improvements in Illuminated Road Surface Signs."

Neuhaus, J., June 22, 1934. (*Convention, France.*)

According to this specification a device for use beneath a road stud for producing a luminous signal on the road surface comprising a reflecting surface of revolution of an arc of an ellipse about an axis passing through the illuminant, the main axis of the ellipse being oblique to the axis of revolution, a second plane reflecting surface oblique to the axis of rotation and a converging lens, which may be a cylinder of revolution, to receive the rays from the source after their second reflection and to make them more convergent.

No. 442,400. "Improvements in Electric Discharge Lamps."

The General Electric Company, Limited, March 28, 1934. (*Convention, Germany.*)

In order to promote effective utilisation of the phosphorescence in a tube adapted to be operated from alternating current, containing gas or vapour, and having a wall comprising phosphorescent material, the tube is provided with one thermionic and two non-thermionic or one non-thermionic and two thermionic electrodes so connected to its two terminals that a discharge passes only when the potential difference between the terminals is of one predetermined sign. The tube thus discharges on only one half-cycle.

No. 442,577. "Improvements in Electric Glow Discharge Devices."

William Jörgensen, July 10, 1935.

This specification discloses a tubular glow discharge lamp of relatively high luminous power for advertising and like purposes. Each electrode of the lamp comprises a conductor extending along the tube and a number of flat plates extending from the conductor substantially at right angles thereto across the tube with their edges against or near the walls of the tube. The conductors may be located near opposite ends of the diameter of the tube and the plates of opposite polarity may be interleaved with one another, a recess being provided at the edge of each plate to clear that conductor to which it is not connected.

No. 442,704. "Improvements in Light Projections.

Wentzel, J., May 1, 1934. (*Convention, France.*)

This specification describes a projector, suitable for a motor headlamp, for obtaining a desired light distribution. The projector comprises a linear light source, a reflector disposed behind the light source and consisting of a surface of revolution about the axis of the light source of a non-circular meridian having a form corresponding to the desired light distribution in the plane of the source and projector axis, and, in front of the light source and parallel thereto, reflecting blades or louvres arranged so as to collect the rays from the reflector and from the source within a predetermined dihedral angle, rays outside this angle being cut off.

No. 442,939. "Improvements in Multiple-Filament Motor Car Lamps."

Dicker, S. G. S., July 16, 1934. (*Communicated by N. V. Splendor, Gloeilampenfabrik.*)

This case covers an electric lamp bulb having two filaments located in planes normal to each other, one of the filaments being partly surrounded by a screen mounted within the bulb and the other being located in a plane normal to the axis of the lamp.

No. 443,221. "Improvements in Multiple Filament Electric Lamps."

Terrell, R., August 22, 1934, *December* 8, 1934. (*Cognate Applications.*)

This specification relates to multiple filament lamps of the kind in which there are provided two or more filaments connected to contacts on the lamp cap, and means are provided for connecting one or other of the filaments at will to a supply source. The cap is equipped with a contact plate connected to one end of all of the several filaments and with a number of contacts each connected with the other end of one of the filaments and with a second contact plate detachably connected to the cap by means of a pin and socket connection. The second contact plate makes electrical contact with one of the contacts only and completely shields the remainder from engaging the terminals of a lamp socket. The second contact plate is movable in relation to the cap to make contact with the various contacts at will, thus to bring into operation any of the several filaments.

No. 443,515. "Improvements in Portable Electric Battery Lamps."

"Concordia" Elektrizitäts - Aktiengesellschaft, March 3, 1934. (*Convention, Germany.*)

This specification covers portable battery lamps, intended for use in such places as mine galleries, in which a switch is controlled by current in supply mains, automatically to switch on the battery lamp when the mains current fails and to switch off when the mains current is restored. The switch may be operated by a bi-metallic element, heated by the mains current. A manually operated switch may also be provided.

No. 443,713. "Improvements in Electric Incandescent Lamps."

Connolly, A. B., August 2, 1934.

The object of the invention with which this speci- invention is concerned is the prevention of explosions where an electric incandescent lamp is used in mines, gas works and similar places where an explosive atmosphere may occur. According to the invention a fusible conductor, connecting the lamp filament with an external contact of the cap, is directly and wholly embedded within the material used for securing the cap to the bulb and entirely within the metal cap.

No. 443,721. "Improvements Relating to Electric Bulbs for Road Vehicle Lamps."

Joseph Lucas, Limited, and Neill, R. L., August 27, 1934.

This specification covers a road vehicle lamp bulb of the kind in which one or more filaments are arranged to lie along or immediately adjacent and parallel to the horizontal axis of the lamp. A shield is arranged to extend upwardly from a position on the horizontal axis of the bulb and to intercept the whole of the direct light from the filament in the upper half of the light beam. However, a second shield may be arranged beneath the front portion of the filament and the upwardly extending shield may be located in front of, to screen, the rear part only of the filament.

Light-Sensitive Cells: Some Applications in Research and Industry

The development of "light-sensitive" cells in a form applicable to general research and industry is quite a recent development. The three papers read before the Illuminating Engineering Society on April 7 were therefore very opportune.

The first paper, by Mr. R. C. Walker, was of a general character and served excellently to pave the way for the two more specialised contributions that followed.

Mr. Walker adopted the description "light-sensitive" to include all the chief forms of cells that are responsive to light and have practical applications. There are, in fact, three distinct types that are of practical interest—the selenium, alkali metal, and rectifier cells.

Types of "Light-Sensitive Cells."

Of these the selenium cell is the oldest and most familiar. Its action depends on the diminution in resistance of a layer of crystalline selenium when exposed to light, and thus requires an applied potential. It is useful in the case of simple trigger circuits where a change in illumination is required to open or close a relay in some exterior circuit, but is less well adapted to photometric measurements.

In the alkali-metal cell stimulation by light produces electron-emission between two surfaces so that in this case also a small current, which may be amplified is allowed to flow if a potential is applied. Such cells are highly sensitive in some forms, and under other conditions have the advantage that a linear relation between the illumination and the photoelectric current exists For precision photometric measurements this form of cell, therefore, has special advantages.

The third type—the rectifier cell—may assume various forms, but all have common characteristics. The name is derived from the original main use of such cells, i.e., for obtaining direct current from an alternating current supply. In the case of this form of cell no applied potential is necessary—a great simplification since, if cell is used with a suitable meter, readings can be obtained without a battery being needed. For rough measurements of illumination, therefore, this type has great advantages. By keeping the external resistance small and by avoiding undue changes in temperature, a linear relation between illumination and current can be preserved. Furthermore, the response throughout the spectrum resembles that of the eye more closely than is the case for the other types of cells mentioned above. If a relatively high degree of accuracy is required, however, somewhat more complicated arrangements are necessary.

Applications of Light-Sensitive Cells.

In the case of most industrial applications an exact linear relation between illumination and current is not usually necessary. The aim is usually to open or close a controlled circuit when a specified change in illumination takes place. The arrangement of cell and accessories may take various forms according to the sensitiveness and speed of action demanded. Frequently the simplest applications are the most useful ones. An instance is the counting of objects passing a conveyor or being delivered from a machine after a manufacturing process. If the objects are light in weight, awkward to handle, or variable in size, photoelectric methods may be greatly preferable to mechanical ones. In paper making and printing machines such apparatus is often used, e.g., to give warning of web-fractures in high speed paper making; to control re-reeling of paper; to ensure correct register in cases of double printing; and to count newspapers or printed matter as delivered from the machine. In the making of paper bags again, photoelectric control serves to ensure an imprint on the front of the bag being maintained central.

Fig. 1. Showing control of Street Lighting Unit by Radiovisor equipment using selenium resistance bridge.

The use of photoelectric equipment for burglar alarms and for the detection of smoke in factory chimneys is familiar. It is likewise an easy matter to switch on advertising signs automatically when daylight fails by means of light sensitive cells, and there were other possibilities—for example, in the case of signs adjacent to railways it would not be difficult to arrange for the sign to be lighted up automatically when a train passed by. Similarly, the arrival of a motor car could be made to light up a traffic sign. On the London Electric Railways light-sensitive devices have been widely used, for example in control of warning signs on curved plat-

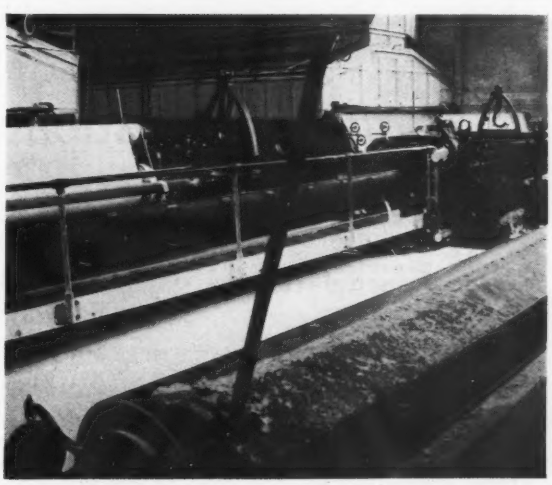
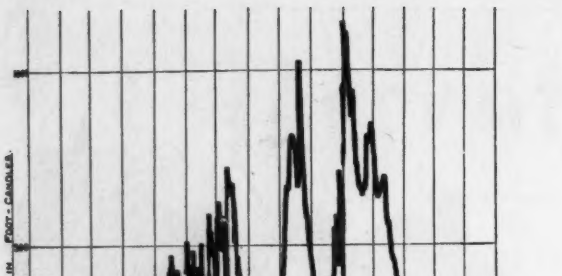
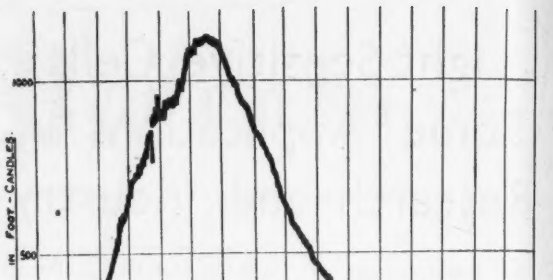


Fig. 2. A Photoelectric Installation applied to a Paper-making Machine in order to give warning should the web fracture.



A photoelectric record of Daylight Illumination on a typical summer day, with varying clouds.



Another record on a cloudless day—a very unusual condition!

forms where a gap exists between the edge of the platform and the step of the car. During periods of light traffic escalators can be run at slow speed (thus saving wear and tear) and automatically speeded up when the traffic rush begins.

An application of special interest is to sporting events. The passage of competitors through the light beam enables an accurate record of the times of races to be taken—far superior to that attainable by hand timing.

Daylight Problems.

Mr. L. H. McDermott's paper fell into three main sections, the first part describing the photoelectric relay control devised at the National Physical Laboratory, the second the continuous recording of daylight illumination, and the third an investigation designed to determine the minimum working illumination in offices, i.e., the point at which workers unconsciously became dissatisfied with daylight and the artificial light is turned on.

The great advantage of this method for obtaining records of daylight is obvious. To make such measurements visually would be a most laborious task; with photoelectric equipment the record of varying daylight is traced automatically. The two

Photo-Electric Cells, Selenium Layer Type

(Brit. Pat.) Round or Rectangular, for all kinds of light sensitive apparata.

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ARMOUR HOUSE,
ST. MARTIN'S-LE-GRAND,
LONDON, E.C.1.

Tel. National 5025.

Our Photo-Electric Cells are of solid construction with no fragile parts such as glass bulbs, etc.; they are self contained—no batteries required. These cells combine high sensitivity, perfect stability with uniform quality, wide range of colour response and rapid response to light fluctuations.

Some Applications of Our Photo-Electric Cells

Photometers
Exposure Meters
Pyrometers
Smoke Detectors
Burglar Alarms
Door Openers

Automatic control of:
Street Lighting
Railway Signals
Sorting Machinery
Grading of Paper
Water Gauges & Manometers

Made in various standard sizes

Many other applications either with or without our Patent Relays.

graphs shown are instructive in indicating how greatly changes in intensity of natural light may vary on different days.

Control of Gas Lighting.

The paper by Mr. W. H. B. Hall described the equipment used by the South Metropolitan Gas Company when engaged in redesigning the gas lighting of a London schoolroom. The essential apparatus included a rectifier photoelectric cell, a sensitive galvanometer relay fitted with maximum and minimum contact, a 3-volt dry cell, and a time-actuated street lamp controller of familiar type. The apparatus was shown in action at the meeting, "calor gas" being applied owing to the absence of any pipe-supply in the lecture theatre. [Members commented on the instance afforded of gas engineers bringing electricity to their aid!] In response to questions, Mr. Hall explained that the instrument was set so that the lights would come on when the daylight fell to 5 foot-candles, and were extinguished when it rose above 7 foot-candles.

Other interesting points were mentioned by members in the course of the discussion. Mr. F. C. Smith made some reference to one most important application of the photo light-sensitive cell—for the control of street lamps. In this connection, he remarked that the dry cell was apt to prove a weak link in the chain and needed careful attention. He also mentioned the use of gas pressure to operate street lamps—a method already being adopted in Berlin.

Mr. Renshaw gave an interesting account of the installation of light-sensitive cells to control traffic signals in Surrey for the benefit of pedestrians—one curious point being that the colour of passing vehicles affected the action of the detectors materially, a red bus being apparently particularly potent in this respect!

Selenium Cells in Photometry

The Institution of Electrical Engineers and the Illuminating Engineering Society have evidently been working on parallel lines recently, for at the meeting of the I.E.E. Meter and Instrument Section. on March 6, several papers dealing with the use of photoelectric cells in photometry were presented. Professor J. T. Macgregor Morris and Mr. R. M. Billington gave an instructive account of the selenium-iron photo-rectifier cell. One feature of this cell is the reduced sensitivity with increased temperature owing to change in internal resistance. The response to intermittent illumination is poor at present, but it is readily applicable to photometry owing to the ease and simplicity with which measurements can be made; the absence of any auxiliary apparatus, such as a battery, being a great advantage.

In a second paper Mr. J. S. Preston described the form of selenium rectifier cell, developed for photometric work at the National Physical Laboratory. Apparently, uniformity is not yet as good as could be desired. A small percentage of cells may be unsatisfactory for photometric work owing to large drift, high temperature coefficient, instability of output, change of sensitivity with age, etc. Variations in sensitiveness over the surface of a cell may also be found. Selection from a batch of cells is therefore necessary for accurate work. Cells can, however, be found which meet all the requirements of precision photometry, apart from the question of colour-correction. The ideal use of instruments embodying such cells is for the comparison of two illuminations not differing greatly in colour. Instruments of considerable practical utility and simple in operation can be devised. The cells are, in fact, suitable in the main for comparisons of a commercial type when the accuracy aimed at is not so high as that attainable visually. At the same time, in expert hands, they may yield results of scientific precision.

"Recommended Values of Illumination"

ERRATA.

The attention of members is drawn to the following corrections in the "Recommended Values of Illumination," which recently appeared in the Transactions of the Illuminating Engineering Society (Volume I., No. 3, March, 1936, pages 42-44).

Page 43—

Public Buildings.
Library. Backs of Books ..... 2-4 ft.-candles

Coal Breaking.
Washing and Screening ..... 2-4 ft.-candles.
Control Points and Picking Belt 15-25 ft.-candles.

Drawing Office. Main heading in thick type.

Page 44—

Tobacco Products. For "Stiffing" read "Stripping."

SIMPLEX

Industrial, Commercial & Street Lighting Shopwindow

REFLECTOR FITTINGS

SCIENTIFICALLY DESIGNED

SIMPLEX ELECTRIC CO., LTD.

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"LUX"

(La Revue de l'Eclairage)

WE have pleasure in announcing to our readers that we have entered into an arrangement to receive subscriptions for the French Journal "Lux" (La Revue de l'Eclairage). The subscription per annum is 30 francs, the approximate equivalent of which in English money is Seven Shillings and Sixpence (7/6).

"Lux" is the only French journal which specialises in all aspects of lighting; it is the official organ of the Association Française des Ingenieurs de l'Eclairage (equivalent to the Illuminating Engineering Society in France).

It furnishes a complete record of interesting developments in lighting in France and on the Continent. It is fully illustrated and in particular devotes a considerable number of its pages to Decorative Lighting.

By studying these articles and the numerous photographic reproductions of modern lighting installations the reader can readily gain an excellent impression of French methods and practice in matters of Illumination.

Applications for subscriptions will be received by "Light and Lighting," 32, Victoria Street, London. S.W.1.

St. Bartholomew's Hospital

The Lighting of the New Medical School

The new Medical School attached to St. Bartholomew's Hospital, which incorporates the old Charterhouse School buildings with additions, serves not only as a training school for medical students but as a centre for research.

Special care has been devoted to the lighting, which was prepared by Messrs. Holophane, Ltd, in conjunction with Messrs. Handcock and Dykes, consulting engineers. The installation was carried out by Electrical Installations, Ltd. (London).

In the adjacent illustrations the methods adopted in three typical rooms are seen. In the Anatomical Dissection Laboratory a high value of illumination is needed and about 20 foot-candles was provided. Two different types of prismatic reflector, equipped with 300 watt lamps, were used. The walls of this section are light cream in tint, thus serving as good diffusers of light, and the floor is finished in terra cotta. In the Biology Laboratory similar conditions were provided.

The design of the ceiling in the Histology Laboratory enabled the requisite illumination on the desks to be obtained with close ceiling fittings incorporating special prismatic reflectors. Each 6-panel Hedralite unit accommodates four 60 watt lamps with appropriate reflectors. In the Physiological Lecture Theatre 6-panel Hedralite ceiling units were again used, but in this case six 75 watt lamps in suitable reflectors were incorporated in each unit and the spacing was considerably greater.

We understand that the authorities are well satisfied with the conditions, which should serve as a guide to similar future installations.

Fig. 1. The Anatomical Dissection Dept., lighted by 300 w. lamps in Holophane Reflectors.

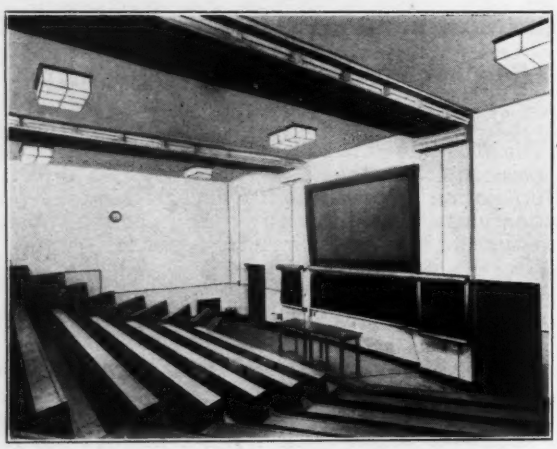


Fig. 2. The Physiology Lecture Theatre, lighted by Holophane Hedralite ceiling fittings.

Fig. 3. The Histology Laboratory, in which Hedralite ceiling fittings are again adopted.

The Development of "Red Stains" on Heat-Resisting Gas Globes

by W. M. HAMPTON, Ph.D., B.Sc., F.Inst.P.

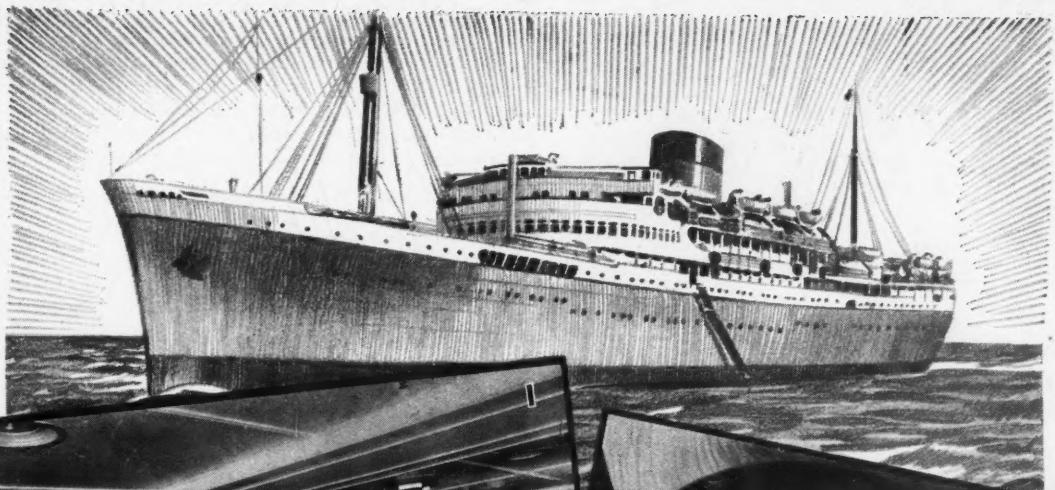
The development of a reddish stain on heat-resisting gas globes used with high pressure gas has been noticed from time to time. The origin of this colour has now been cleared up as a result of investigations carried out in the Research Laboratories of Chance Brothers and Co., Limited, Glass Works, Smethwick, who are well known as manufacturers of this type of material.

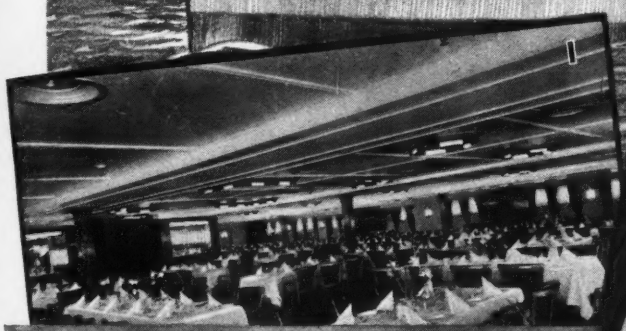
Chemical analysis showed in all cases that the colour was due to the presence of reduced copper. Since the stain was not removable by hydrochloric acid, but could be dissolved away by hydrofluoric acid, it follows that the stain had been burnt in at a temperature above the softening point of the glass.

It has been found possible to reproduce the mark by various methods, such as by the evaporation of a dilute solution of copper sulphate to dryness on the globe, with subsequent strong heating with a flame. It was also found possible to develop it by allowing a bunsen burner with a brass stem to "burn back," and the green coloured flame so obtained to be directed on to the globe; after a few hours' heat-heating a pink stain was produced, which was identical with the marking on the globes that had been returned for inspection.

Since there is no copper in the original glass, it is clear that this stain comes from the fittings, either due to corrosion and subsequent solution of the products of corrosion by condensed moisture, which runs down on to the globe and evaporates there, or by the impact of a flame containing volatile copper compounds due to incomplete combustion in the first place.

The fact that it is possible to heat the glass so that its surface gets above the softening point, and to do this without fracture, confirms the very high heat-resisting qualities which are obtainable with gas globes at the present time.





10,000
MAZDA LAMPS
for R.M.M.V. 'STIRLING CASTLE'

Mazda lamps are used exclusively on this new luxury liner, including over a thousand Mazda Light Tubes installed (mostly without fittings) in the public rooms and cabins, where they produce a very charming and unusual effect. Apart from their artistic appearance and adaptability, Mazda Light Tubes have the tremendous advantage, in the case of ship lighting, of minimum projection from ceiling or wall.

MAZDA LAMPS

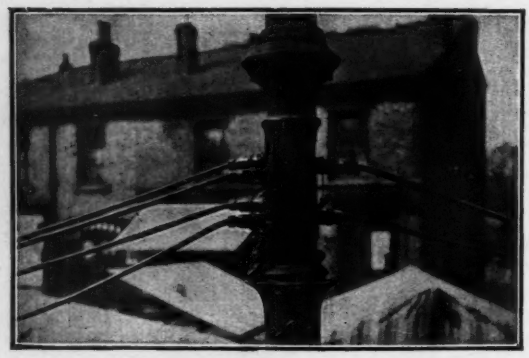
B T-H

3632

(1) *Cabin Dining Saloon.*
(2) *First Class Lounge.*
(3) *First Class Dining Room.*

Photographs by courtesy of Messrs. Heaton Tabb and Co., Ltd., who were responsible for all decorations, furnishings and lighting.

MADE IN ENGLAND BY THE BRITISH THOMSON-HOUSTON CO., LTD.
CROWN HOUSE, ALDWYCH, LONDON, W.C.2



This illustration of part of a "NIPHAN" market lighting installation shows main feeding sockets fitted to a lamp standard. The "NIPHAN" system is adaptable for every type of temporary or portable lighting installation and designs will gladly be submitted.

MARKET LIGHTING with the NIPHAN System . . .

FOR some years we have been collaborating with public lighting authorities in devising temporary lighting installations for market stalls. The picture shows part of a "NIPHAN" market job, in which 6 sockets, in conjunction with a fuse board, were mounted on a lamp standard, with plugs leading to 3-way tees and suspended through-sockets.

¶ *Our extensive market lighting experience is at your disposal.*

Announcement of
SIMMONDS & STOKES LTD.,
4, Vernon Place, Southampton Row, London, W.C.1.
Tel.: Holborn 8637. 'Grams: "Niphon, London."

NIPHAN

Flashes

An ambitious scheme for an "Illuminations Fortnight" is being prepared at Stockport, the cost of which will be about £10,000.

* * *

A new type of 2,000 c.p. gas lamp, erected by the Cardiff Gas Company in the Stanwell-road, Penarth, has met with general approval. It is suggested that the same methods should be applied elsewhere, where the present lighting is considered poor.

* * *

A scheme for the improvement of the street lighting in Bournemouth is being prepared by the Lighting Committee.

* * *

The Wandsworth Borough Council has entered into a contract with the South Metropolitan Gas Company for the relighting of all the streets in the borough which lie in the company's area of supply. About 106 miles of roads are covered by the agreement. The system employed will be the company's new "Supervia" directional gas lamp, with high pressure for main roads and low pressure for the remainder. When the scheme is completed Wandsworth should have some of the best lighting in London.

* * *

An important street-lighting scheme in this country will be completed in some three months' time when 235 new sodium lamps will have been added to the sixty originally installed in 1932 in Purley Way, Croydon.

* * *

We hear that the Stoke-on-Trent Corporation has instructed the Corporation Gas Department to light the Newcastle Road by about thirty 8-light Rochester gas lamps with Holophane dish refractors and other special directive devices. This important main traffic thoroughfare between the north and south is being widened and will be lighted to the standard specified in the Interim Report of the Ministry of Transport Departmental Committee on Street Lighting. The high power lighting decided upon will be extended as the road widening is extended.

* * *

£500 has been voted for additional illuminations in the Old Steine at Brighton, and for floodlighting the Parish Church and the Royal Pavilion.

A year's contract for gas lighting has been signed by the Greenock Corporation. Some 430 lamps are involved.

* * *

Alloa Corporation Lighting Department have improved greatly the lighting of one of the main roads; 8-light high-power gas lamps, mounted 18 feet high on steel columns and equipped with directional reflectors, have been installed.

* * *

A 20-ft. pillar of light in the middle of the lake is to be one of the features of the "Illuminations Fortnight" at Roker, Sunderland, in September.

* * *

It is claimed that, as a result of recent improvements, Yarmouth has the best street lighting in East Anglia

* * *

A permanent floodlighting installation is to be installed at the London Mansion House, at a cost of £130.

* * *

In Milverton (Somerset), under a new ten-year contract for street lighting, an installation of modern gas lamps with clockwork control and special directional reflectors is about to be made.

* * *

Sodium vapour electric discharge lamps are being tried out in experiments in road-lighting at Mont de Marsan, France.

A view of Albany Street, N.W.1, which the St. Pancras Borough Council have recently re-lighted with "Siemens" electric discharge lamps in "Gower-Sieray" lanterns.

Another difficult Lighting problem solved by G.V.D.

Probably this is the first time that a building of this kind has been featured in a Lighting announcement. It is typical of many in our towns and cities. There is no elaborate interior treatment to create illusion. But we are concerned with Lighting, and the illustration certainly gives a good indication of efficient Lighting under difficulties. The bulk of the paint-work is dark green and not very helpful for reflection, yet the entire hall appears bright and cheerful and, although one might expect criss-crossing shadows from the steelwork, the ceiling, walls and floor are uniformly illuminated. Lamps are used at intervals of six feet, and the current consumption is remarkably low—approximately one-sixth of the normal for a building of this kind. Lighting of this type makes a building as serviceable by night as it is during daytime. It obviously is very suitable for many classes of buildings, including Churches, Concert Halls, Badminton, Squash and Tennis Courts, Factories, etc.

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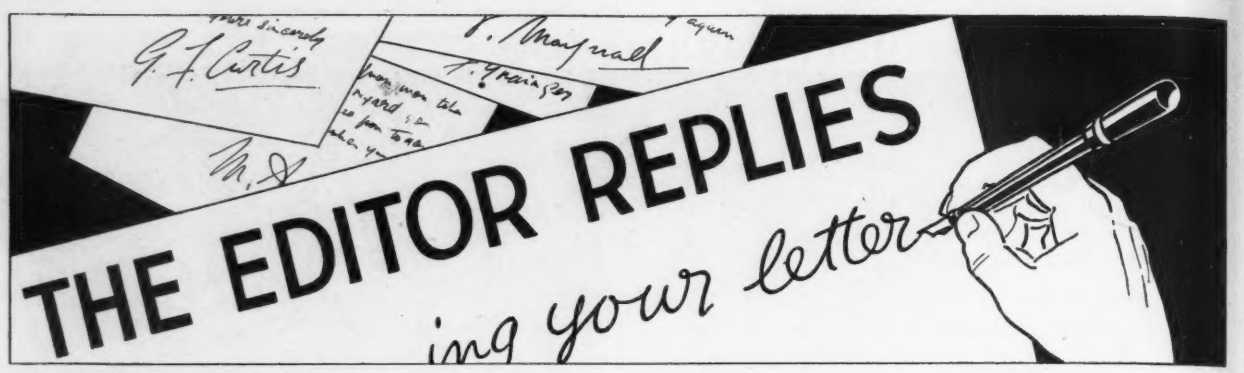

" Come then, Gentlemen . . . . . put your questions ! "

We must open this month with a confession of error. In acknowledging the helpful information that Mr. James Sellars sent us in regard to installations of sodium electric discharge lamps, we unaccountably described him as public lighting engineer of Liverpool. We have not even Dr. Johnson's famous explanation of error (" Ignorance, Madam—pure ignorance "). We knew—*of course we knew*—that Mr. Sellars is public lighting engineer of Manchester. The error, however, affords us an opportunity, in putting the matter straight, of recalling the excellent work that Mr. Sellars is also doing as honorary secretary of the local section of the Illuminating Engineering Society in that city.

The recent discussion before the Society on **light-sensitive cells** has brought us several queries. We have been asked to furnish names of makers and suppliers of such cells. One such source of supply will be found in " Where to Buy." Perhaps some other firms may care to send us information on their doings?

Our attention has also been drawn to a novel application of such cells, reported in the daily Press—the **sorting of letters by the G.P.O.** Apparently the photo-electric cell is capable of discriminating between " first-class mail " having stamps of 1½d. and higher value on it and matter sent open and bearing ½d. stamps. No doubt the colour of the light reflected from the stamp (possibly accentuated by a light-filter) makes automatic selection possible. One wonders, however, what happens if a writer elects to use three ½d. stamps instead of one 1½d.—but perhaps the automatic sorting is only a first step, supplemented by manual sorting afterwards.

We notice, by the way, a suggestion in a recent paper before the Institute of Actuaries, advocating the " octonal " system of numeration in preference to the decimal one. The use of a photo-electric cell with such a system would render possible an inexpensive machine which would solve all problems of calculation completely.

We have been asked what is meant by **" three-colour neon "** installations. As it happens we received in conversation only the other day a description of such installations in Paris, where they are proving quite popular. The system consists in the combination of tubing giving light in three colours such as red, white, and green, which may be used either separately or simultaneously. The combined effect is described as a " warm white," but certain colours, notably green and red shades, are rendered more vivid. Sometimes the light is applied indirectly, i.e., the tubes are concealed behind cornices, etc., but more usually the tubes are in full view and serve as a decoration. We have also been asked if such installations exist in London. We believe there are already one or two. Can any readers furnish particulars?

Church lighting not infrequently presents interesting problems. One of these, recently brought to our notice, is the **lighting of pulpits.** It is suggested that the not unusual practice of providing a screened tubular lamp mounted along the edge of the reading-stand does not answer very well. We quite agree. Illumination from a lamp thus placed is necessarily uneven, and the light coming at such an oblique angle shows up any folds, crinkles, or imperfections in the paper. Moreover, the upward light striking the face of the preacher (like the unrelieved use of footlights on the stage) is apt to have a distorting effect. On the other hand, if the horizontal tubular fitting is raised somewhat there is danger of troublesome regular reflection into the eyes of the preacher, and the fitting obstructs the clear view of him which a congregation likes to have.

Possibly the requisite illumination could be better furnished by two shielded stand lamps, one on each side of the reading stand, but these again are apt to interrupt the view of the preacher from some angles. On the whole the best method is probably that which we have seen adopted with good effect —the use of a pendant fitting, comprising suitable lamps concealed under diffusing reflectors within a hood, situated several feet above the head of the preacher and directing light downwards on the reading stand. The view of the preacher is thus uninterrupted and a good reading illumination is readily secured. Admittedly it is something of a drawback to have to support the fitting by chains running upwards to a considerable height, but the enclosure surrounding the fitting should not be unsightly and may even serve to round off the appearance of the pulpit in the manner of the decorative sounding boards to be found in some old churches.

In regard to **jobs.** We have had an enquiry from a reader who would be glad to hear of a **really live young man** with some knowledge of office lighting, etc., and capacity for " selling light." If there are any readers who feel able and disposed to " fill the bill," will they please apply to us, giving particulars of experience, present position, and salary desired.

In response to comments on the note in our last issue on **" New Buildings in Whitehall,"** we should explain that we have no knowledge of plans in regard to lighting—though obviously they should afford good opportunities. From illustrations in the daily Press one gathers that the plans are somewhat original, comprising an imposing upper pillared frontage and four towers with intermediate courts. There ought, therefore, to be scope for floodlighting.

In conclusion we might perhaps (in view of recent requests) repeat that whilst we welcome inquiries and will answer them when we can, we do *not* undertake to design lighting installations free of charge—nor can the Illuminating Engineering Society undertake to do so!

TRADE NOTES AND NEWS

150 Watt Electric Discharge Lamps

A notable announcement at the beginning of last month was that relating to the new 150-watt electric discharge lamp, which is being put on the market by the leading lamp-manufacturing concerns. This is suitable for 200-260 A.C. circuits, and is stated to yield 32 lumens per watt, an efficiency which, whilst somewhat less than that of the larger discharge lamps, is still much higher than that of a filament lamp of similar power. This development should serve to extend still further the use of electric discharge lamps in industry. The 150-watt lamps can be conveniently applied for special lighting, and mounted at moderate heights, say, ten feet above the working plane.

Flameproof Floodlights

We illustrate below a new floodlight projector introduced by Simplex Electric Company, Ltd., which incorporates a flame-proof fitting. It is believed to be the first floodlight offered on the market for use in explosive atmospheres. There are quite a variety of applications for such units. We hear that they are already proving of service for handling inflammable cargoes on board ships, for use in coal bunkers, and in factories devoted to various special processes, such as spraying with cellulose, dope, etc.

The new Simplex LS.80 Floodlight, in which is incorporated a certified flame-proof fitting; specially adapted for use in explosive atmospheres.

A Novel Gas Lamp

The new type of lamp, illustrated below, is believed by the makers, Messrs. W. Parkinson and Co., to constitute a radical and important departure in gas lighting. It is, in fact, a "dual purpose" lamp, as its name suggests; for it fulfils the functions both of a floodlighting unit and a lamp for furnishing general street lighting. It may be mounted with advantage at heights of eighteen to twenty-five feet. Kerb-lighting is a special feature.

The Parkinson "Maxill" Gas Lamp consumes only 15 cubic feet per hour and furnishes over 200 candlepower (max.) from a faceted reflector and over 4,000 candlepower (max.) from a reflector of the parabolic type.

Architectural Lamps and Fittings

Under this title Messrs. Siemens Electric Lamps and Supplies, Ltd., have issued a useful folder illustrating the varied forms and diverse applications of the popular "architectural lighting" tubular lamps. Dimensions of standard lengths, bends, etc., are given, and some very pleasing types of units are shown. One of the most attractive is shown above, but there are many others. One neat application illustrated in the leaflet is the use of the lamps as a luminous border to mirrors above the dressing table.

A pleasing design of Siemens "architectural" fitting with tubular lamps. A great variety of designs is possible with these lamps, which are available in different lengths, and in the form of angles and bends of varying curvature.

Cheaper Electric Lamps

A welcome reduction in E.L.M.A. list prices came into operation on April 27. The reduction is general and applies to such special types as "daylight," "colour-sprayed," and "traction" lamps as well as to the standard Pearl, Clear, and Opal lamps at standard voltages. In general the reduction in price is either 2d. or 3d.—for example, a 100 watt pearl lamp is reduced from 2s. 6d. to 2s. 3d., and a 40 watt lamp from 1s. 9d. to 1s. 7d. In certain cases, however, the reduction is larger, for instance, the 75 watt colour-sprayed lamp goes down from 3s. 3d. to 2s. 9d.

A New "Revo" Street Lighting Unit

The new fitting introduced by Revo Electric Co., Ltd., here illustrated, which is intended for use with 400 watt mercury discharge lamps, is of exceptionally robust construction, the framework and canopy being constructed of heavy gauge copper. The interior is provided with stainless steel reflectors. The side panels facing the directions of the road are fitted with prismatic glass of special design, whereas the panels facing across the road and pavement are fitted with special lenticular glass, which gives an exceptionally bright and attractive appearance. The lantern is provided with a self-aligning condensation proof joint box. This fitting is commended to the attention of public lighting engineers.

Long Range Floodlights

In these days of spectacular lighting there is a constant demand for narrow and confined beams of light for such purposes as illuminating clock-towers, police officers on traffic duty, and figures of people on the stage or the dance floor. We have before us a leaflet issued by Messrs. Davis Bros. (London) which is devoted to such long-range floodlights. A new form recently introduced is stated to have a range of 600 feet and can be used with 60 watt lamps. A convenient form capable of being raised or lowered on a pedestal base is illustrated in the leaflet.

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G.E.C. "GLASSTEEL" DIFFUSER FITTING
The above fitting is intended for use with 150 and 250 watt Osira lamps. It has a pleasing and compact appearance. The application of this form of fitting to the new lamps is an interesting development.

G.E.C. INDIRECT LIGHTING
The indirect lighting installed in the Potted Meat Factory illustrated above has completely eliminated a difficulty previously experienced—the troublesome effect of reflection of light on the capsules of the various containers.

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LIGHT AND LIGHTING

Back Numbers.

Readers are reminded that back copies of this journal (which until this year appeared under the title of "The Illuminating Engineer") are still available. Lists of individual copies dealing with special subjects will be supplied on demand. Complete sets of twelve issues (unbound with index) can be supplied for 1934 or 1935 at 12/6 for the series, and for the years 1928-1933 at 15/- per series. Special Binding Cases, 4/- each.

Electric Lighting in Works and Offices

There is no slackening of the activities of the E.L.M.A. Lighting Service Bureau in regard to conferences. The next, to be held during May 19 and 20, is to deal with the lighting of works and offices. Sir John Brooke, Vice-Chairman of the Electricity Commission, is to give the opening address, and papers by Mr. A. D. S. Atkinson, Mr. H. Lingard, Mr. J. W. Howell, Dr. A. B. Whitworth, Mr. M. W. Hime, Mr. E. B. Sawyer, and Mr. R. O. Ackerley will follow. The concluding address by Mr. R. O. Ackerley, on "Special Lighting Problems," should be particularly interesting. We observe that the sagacious plan of getting prominent outsiders to open the discussion is again being followed, two familiar figures, Sir David Munro (Secretary of the Industrial Health Research Board) and Mr. D. R. Wilson (H.M. Chief Inspector of Factories) being first on the list.

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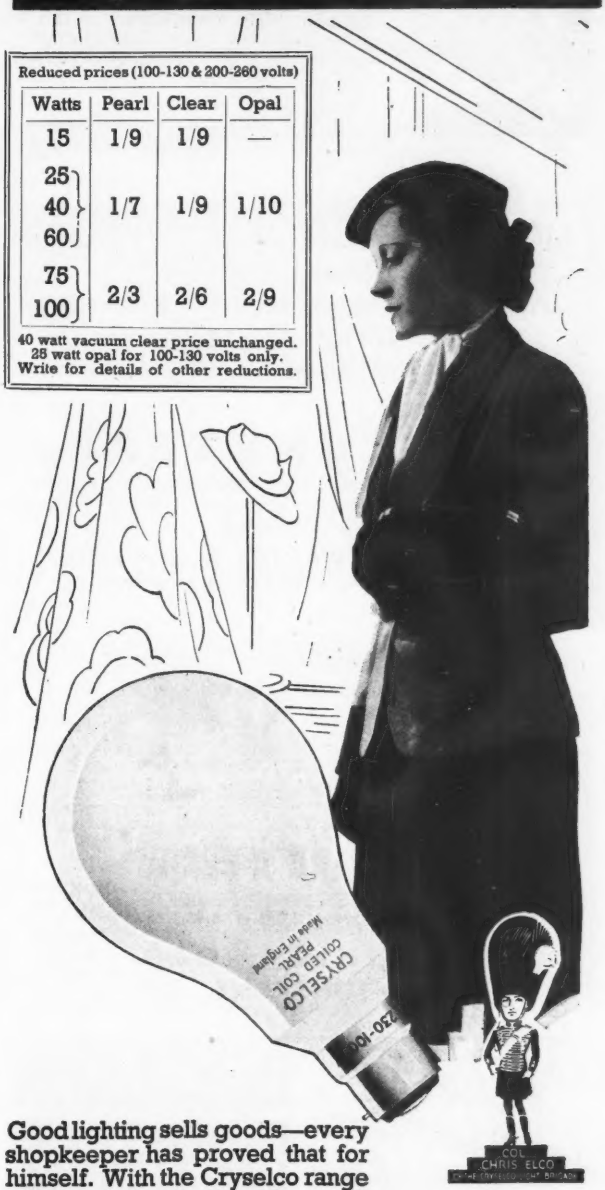

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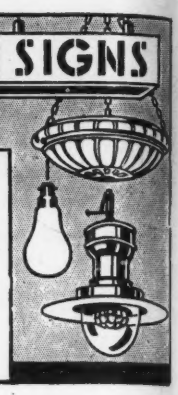

We invite applications for spaces in this new section of the journal. Particulars of terms for each space (approx. 1 inch deep and 3¼ inches wide) are given below.

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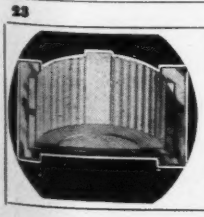
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PUBLIC GAS LIGHTING DEVELOPMENTS

Local authorities all over the country are taking steps to improve existing street lighting installations and to choose systems of lighting which will ensure road safety for pedestrians and vehicles alike.

Lamps of low candle power are being replaced by others of a more modern type and with greater illuminating power; the effect of the spacing and the height of lamps on the distribution of light is being carefully considered; the use of reflecting devices is steadily growing; and automatic control of lamps is being rapidly extended.

Most recent public lighting contracts rightly provide for such improvements. Under a new agreement, for example, made by the Ruislip-Northwood U.D.C., extensive modernisation of lighting is to be carried out. This Council, after practical tests with modern methods of lighting (experimental installations were installed on certain roads), chose gas to light the district for the next ten years.

Among the many 1935 and 1936 contracts which specify the use of gas for public lighting may be mentioned the following:—

15-Year Contracts:	*Southall-Norwood, Dagenham.*
10-Year Contracts:	*Ilfracombe, Cambridge, Northampton, Blyth, Margate, Southwark, Wigston, Hayfield, Penge.*
7-Year Contracts:	*Harrow, Wanstead-Woodford, Selkirk, Hatfield.*
5-Year Contracts:	*Wembley, Deal, Brentwood, Falmouth, Walton-on-Thames, Diss, Kidwelly, Egham, Budleigh-Salterton.*

Night photo of B.B.C. No. 3 Studio, Maida Vale, showing the lighting effect from Holophane Controlens Units.

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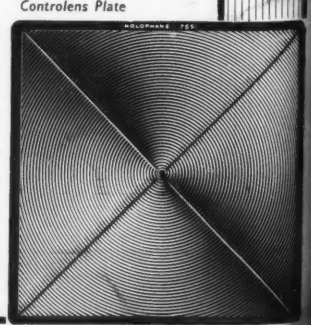

WRITE FOR CATALOGUE GIVING DETAILS OF THE CONTROLENS

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